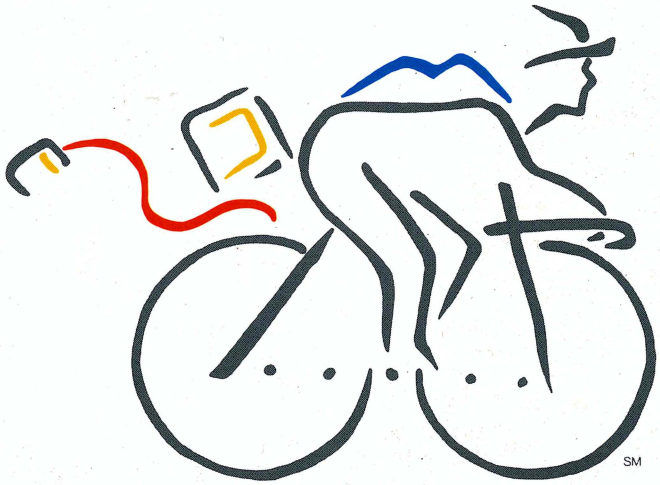
SPRING 1986

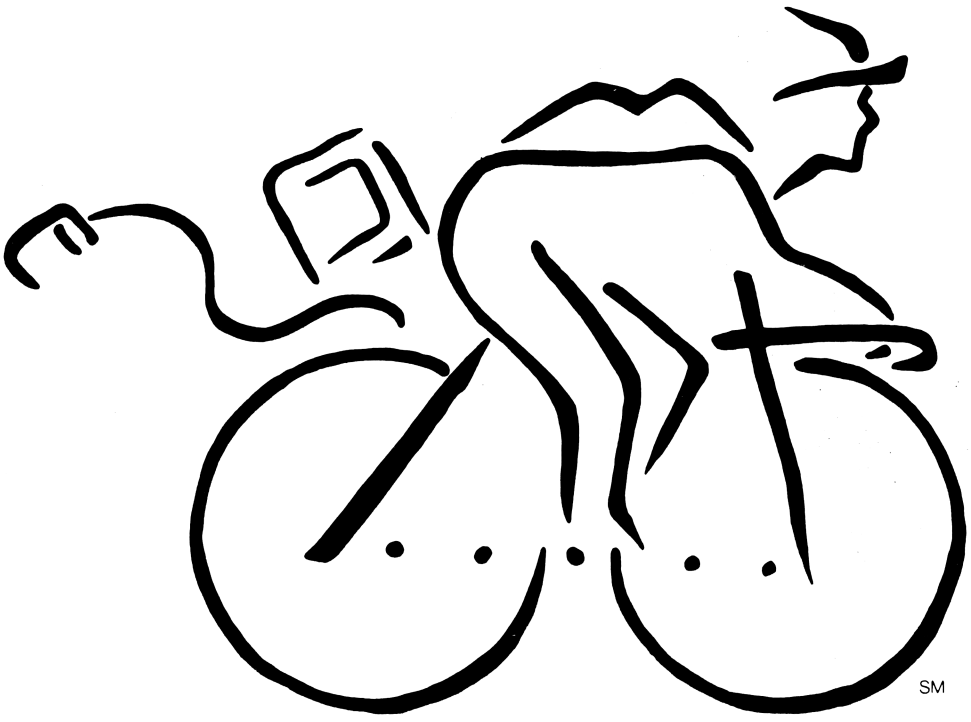
Vol. 2 No. 2
Four Dollars

WHEELS FOR THE MIND

An
Apple University
Publication
Prepared at
Boston College



WHEELS FOR THE MIND



A SPECIAL OFFER

Welcome to *Wheels for the Mind,* the quarterly university publication devoted to one important goal—creative thinking through creative computing.

The information and ideas included in every issue of *Wheels for the Mind* speak for themselves. Please accept this sample with our compliments and take note that if you subscribe right now, you'll get 25% off the regular price. Your cost: only $12.

Just use the postage-paid reply card inside the back cover. At 25% off, it's like getting another quarterly issue free-in addition to the one you're holding now!

John Sculley
President and
Chief Executive Officer
Apple Computer, Inc.

Dear University Member:

You've taught us something.

At Apple, we've learned that serious professionals like you need a comprehensive source of information on computing developments.

As you know, many important developments come out of the nation's universities. After all, universities have traditionally been a seedbed for positive growth and change in society. It's no surprise, then, that in this age of rapid technological growth, universities should lead the advancement of academic computing.

The goal of Apple and the Apple University Consortium was to gather new ideas from many universities and organize them in an easy-to-read format.

That's what *Wheels for the Mind* is all about. It's a quarterly publication for students and faculty at colleges and universities. Its purpose is twofold: first to help you get the most benefit from your academic computing; and second, to assist universities in their role as innovators.

We invite you to try *Wheels for the Mind.* The introductory subscription price is just $12 per year-a 25% discount off the regular price. When you read through these pages, you'll find a wealth of ideas from educators, students, and other academic developers-ideas that will help your own personal computing goals.

Return your subscription card today. You'll not only save money, you'll stay on top of a fascinating new world.

Sincerely,

John Sculley

P.S. I hope you enjoy this free sample issue of *Wheels for the Mind,* a forum for ideas and developments that you won't find anywhere else. For a one-year subscription, simply return the order card inside the back cover. You'll automatically receive a 25% discount.

Wheels for the Mind

Table of Contents

File Edit **SPRING WHEELS**

DIALOG BOX	PAGE 1
NEW FROM APPLE	PAGE 20
NEWS AND NOTES	PAGE 32
NEWS FROM THE NETWORKS	PAGE 53
INTERNATIONAL	PAGE 62
TECHNICAL DEVELOPMENT	PAGE 71
TIPS AND TECHNIQUES	PAGE 80
RESOURCES	PAGE 90
PROJECT REPORTS	PAGE 98
MACINTOSH PRODUCTS	PAGE 174
PRODUCT DESCRIPTIONS	PAGE 182

Editorial

Spring 1986

Welcome to the spring issue. I hope you will find many interesting items about the Macintosh™ computer. I also hope that you will respond to some of the requests for Work Not Yet in Progress, your Favorite Desk Accessories, and Project Reports, or just write and submit an article about whatever is of interest to you.

Welcome to our spring issue.

The summer issue of *Wheels* will feature a special section on desktop communications. Each subsequent issue will also contain a "theme" section. Of course, all of the regular sections of *Wheels* will still appear.

The spiral Wheels for the Mind display that appears in this issue was generated by sending a PostScript® program to the LaserWriter™ printer. The program appeared in the latest issue of Yale University's Macintosh newsletter. My thanks to its staff. And since the LaserWriter is becoming more popular, look for some PostScript program listings to appear in the Technical Development section of future issues.

Spiral* Wheels*!

Hope to hear from you. Have a great spring!

If you wish to send along an article, project status report, or other submission, forward it to:

Peter Olivieri **BITNET: OLIVIERI@BCVAX3**
Wheels for the Mind
Computer Sciences F430
Boston College
Chestnut Hill, MA 02167

AppleLink Address: A0130

Please send your ideas along.

Please try to send a disk with your words of wisdom, articles, applications, experiences, or software. Screen dumps are great,
and you are encouraged to include them. All disks will be returned. Of course, you can also send along written material if you like. It's just that disks are easier to handle at this end.

The success of this publication depends a lot on the participation and support of all of you. Please contribute: Don't wait for someone else—do it yourself.

Editor: Peter Olivieri

Copy Editor: Anne Kaplan-Neher

Contributors: Beth Ann Moore
Jerry Keough

Coordinators: Lori Schieferstein
Bob Olliver

Wheels for the Mind is prepared on a Macintosh computer using Aldus PageMaker, and printed out on an Apple LaserWriter printer.

An Apple University publication prepared at Boston College. Published quarterly. © 1986 Apple Computer, Inc.

Apple, the Apple logo, and Lisa are registered trademarks of Apple Computer, Inc. AppleLine, ImageWriter, LaserWriter, MacDraw, MacPaint, MacProject, MacTerminal, MacWorks, MacWrite, and Switcher are trademarks of Apple Computer, Inc. The Wheels for the Mind logo is a service mark of Apple Computer, Inc. Macintosh is a trademark of McIntosh Laboratory, Inc. and is being used with express permission of its owner. Helvetica, Palatino, and Times are registered trademarks of Allied Corporation. ITC Avant Garde Gothic, ITC Bookman, ITC Zapf Chancery, and ITC Zapf Dingbats are registered trademarks of International Typeface Corporation. PageMaker is a trademark of Aldus Corporation. PostScript is a registered trademark of Adobe Systems, Inc.

Mention in *Wheels for the Mind* does not constitute an endorsement by Apple Computer. Pricing and availability of third-party products is given according to information received and is subject to change.

Table of Contents

1. Dialog Box

A. Work Not Yet In Progress 1
B. Desk Accessory Opinion Poll 5
C. Macintosh at the University of Chicago 7
D. PathMAC (A Videodisc Learning System) 8
E. MacNET (A Campus Network) 10
F. CAI User Group 11
G. Data Acquisition and Control 11
H. The Model Neuron Simulator 12
I. College of Wooster Dorm Network 17
J. ScholarNet : Academic Computer Network 17
K. Reminder 19

2. New From Apple

A. News From AppleWorld 20
B. Macintosh Based Audit Systems 21
C. Peat Marwick Upgrades Macintoshes 22
D. Macintosh Gains Acceptance in Business 22
E. Consultant to University Marketing 24
F. New Support for User Groups 24
G. Northern Telecom Network Agreement 25
H. Apple Trade-in Program 26
I. Inside Mancintosh Available 27
J. Apple Enhances Macintosh 512K 27
K. Consortium Grows by Eight Members 29
L. Apple Label Software Version Numbers 30
M. Apple Announces New LaserWriter 30

N. Schools Require/Rcommend Macintosh 31

3. News and Notes

A. Technical Word Processing 32
B. Computers for the Liberal Arts 32
C. Academic Courseware Available 33
D. Center for Music and Technology 37
E. Third Party Products and the Macintosh Plus 39
F. Faculty Author Development 45
G. Computer Writing Resource Kit 45
H. Software : Registrar's Office 46
I. Software : Notepro 47
J. Statistical Analysis Package 48
K. 12 FT Keyboard Extension Cable 49
L. New Magazine 49
M. MacEmpire 49
N. Fonts for Professional Linguists 51
O. Coming Attractions : Summer Wheels 52

4. News from the Networks 53

5. International

A. World Wide Conference at Cambridge 62
B. Conference Activities 62
C. Keynote Speakers 63
D. AUC Speakers 64
E. Seminar Series 65
F. Conference Attendees 65
G. Eleven+ Macintosh Pluses 69
H. University of Manitoba 70
I. Australian Consortium Members 70

6. Technical Development

A. The 800K Disk Drive 71
B. Programming Aids 72
C. Macintosh Plus Specifications 75
D. LaserWriter Plus Specifications 76
E. External Disk Drive Specifications 77
F. The New ROM 78
G. LaserWriter Fonts Versus Screen Fonts 79

7. Applications Tips and Techniques

A. MacPaint 80
B. MacTerminal 83
C. MacWrite 84
D. Miscellaneous Hints 86
E. Multiplan 88
F. The Insanely Great Option Key 88

8. Resources

A. Publications 90
B. Macintosh Books 90
C. Articles of Interest 94

9. Project Reports

A. Astronomy 98
B. Biology 98
C. Chemistry 100
D. Computer Sciences 106
E. Economics 112
F. Education 112
G. Engineering 117
H. Fonts 125
I. Geology 132
J. History and Politics 133
K. Humanities 133

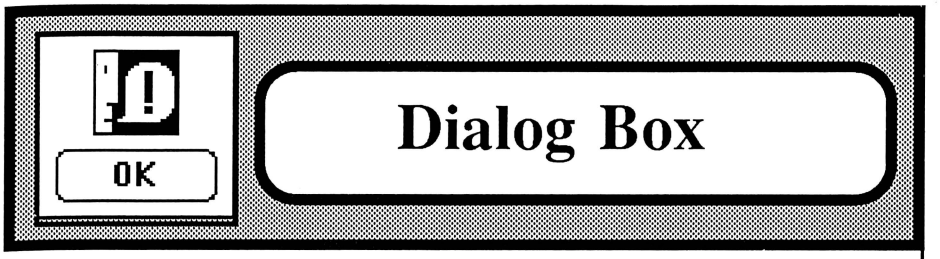
L. Languages 137
M. Management 140
N. Math and Statistics 143
O. Medical 147
P. Miscellaneous 150
Q. Music 157
R. Networks 159
S. Nutrition and Food Science 160
T. Philosophy 161
U. Physics 161
V. Psychology 165
W. Sociology 168
X. Telecommunications 168
Y. Word Processing 172

10. Macintosh Products

A. Product Feature : EduDisc 174
B. Attention Developers 181

11. Product Descriptions

A. Business 182
B. Computer Languages 186
C. Database 189
D. Education 192
E. Fonts 193
F. Games 194
G. Graphics 196
H. Hardware 198
I. Miscellaneous 201
J. Music 203
K. Spreadsheets 204
L. Telecommunications 206
M. Utilities 207
N. Word Processing 208



The Dialog Box section will present articles on a wide variety of topics. They may include descriptions of local area networks, strategies for involving faculty in microcomputing, new course designs, outlines of seminars, suggestions for Apple Computer, Inc., or whatever you wish. Please participate. Write something for us and share it with our community of Macintosh users.

This Dialog Box includes information on the following:

Work Not Yet in Progress
Desk Accessory Opinion Poll
Macintosh Use at the University of Chicago
PathMAC
MacNET
CAI User Groups
Data Aquisition and Control
The Model Neuron Simulator
MacSimplex
College of Wooster Dorm Network Project
ScholarNet
A Friendly Reminder

Work Not Yet in Progress

Sometimes we lack the necessary expertise; sometimes we want the opinions of others before we start; sometimes our "good idea" can be made a "great idea" by a simple addition from another person.

This section contains information about ideas residing somewhere in our gray matter that we would like to see further developed. It will appear each issue. Consider it a good example of a network—a "people" network, not a computer network.

What great ideas are in your mind's eye?

I would like to see this section grow enormously. What a great resource—people willing to work together. Participation is voluntary, so it can only work if you help. Send in your information now (the address is in the Editorial). Do it today. Don't put it off!

Videodiscs

Biofeedback

Name:	Peter Olivieri
Address:	Boston College Computer Sciences F430 Chestnut Hill, MA 02167
Telephone:	(617) 552-3907
Electronic address:	BITNET: OLIVIERI@BCVAX3 APPLELINK: WHEELS
Affiliation:	Boston College
Areas of Expertise:	Teaching Programming (a variety of languages) Quantitative analysis/MIS/Computer science Videotape production Writing
Idea/Interest areas:	A videodisc-to-Macintosh connection Expert systems in sports Biofeedback Multiperson electronic games

Holograms

Animation

Name:	Eric T. Lane
Address:	Physics Department University of Tennesssee at Chattanooga Chattanooga, TN 37403–2598
Telephone:	(615) 755-4523
Affiliation:	The Center for Excellence for Computer Applications
Areas of Expertise:	Animation graphics (Apple® II, Macintosh, Rainbow) Science education (teaching, tutorial development) Physics (teaching, consulting, tutorials) Programming (C, BASIC, Pascal, FORTRAN, Assembler) General systems analysis (theory, applications)
Idea/Interest areas:	Fourier transform laboratory Holograms on the Macintosh Relativistic electromagnetic waves Chemical chromatography simulation Animation in science education tutorials

Name: Nello Lucchesi

Address: Household Commercial Financial Services
Household International
2700 Sanders Road
Prospect Heights, IL 60070

Telephone: (312) 564-5000

Affiliation: Senior vice president, operations

Areas of Expertise: Financial analysis
Accounting
Decision support systems (DSS)

Sales management applications

Idea/Interest areas: Using Macintosh Plus systems as terminals with DEC VAX
DSS applications and systems in the areas of sales-force management, financial analysis (data base, graphics, statistics in an object-oriented computer language), a combination of Smalltalk-80 structure with Express functionality

Name: Kenneth Rumery

Address: Northern Arizona University
Music Department Box 6040
Flagstaff, AZ 86011
or
9 Pine Ridge Drive
Flagstaff, AZ 86001

Telephone: (602) 774-1584 (home; office number changes in April)

Affiliation: Faculty, Northern Arizona University

Music instruction

Sailing

Areas of Expertise: Teaching
Writing
Music composition, theory, analysis
Music CAI
Electronic/digital music
Conducting
Sailing

Idea/Interest areas: Videodiscs for music instruction
Expert systems in music
Music processors
Music analysis simulation
Sailing simulations

Keyboard maps

Microsoft FILE reports

Name:	**David Wyatt**
Address:	**415 Warren Road Ithaca, NY 14850**
Telephone:	**(607) 257-1894**
Electronic Address:	**BITNET: T.RF4J@CRNL20A**
Affiliation:	**Professor of Southeast Asian History Cornell University**
Areas of Expertise:	**Southeast Asian languages, especially Thai and Lao Bibliography, especially Southeast Asian**
Ideas/Interests:	**A good tool for dynamic keyboard remapping (instant changes within application) A good report generator for Microsoft FILE**

Landscaping

Architecture

Name:	**Dennis Gail Abbey**
Address:	**Room 302, Design Building School of Landscape Architecture College of Design Baton Rouge, LA 70803**
Telephone:	**(504) 388-1434**
Affiliation:	**Louisiana State University School of Landscape Architecture**
Areas of Expertise:	**Landscape analysis and design**
Ideas/Interests:	**Design templates for landscape architecture Uniform specification system**

Name:	**Michael T. Ganci**
Address:	**Informatics Group, Inc. 80 Shield Street West Hartford, CT 06110**
Telephone:	**(203) 724-4040**
Affiliation:	**Consultant to several school systems, businesses, and municipalities**

Areas of Expertise:	**Teaching and training** **Authoring systems** **Instructional design** **Courseware development** **Writing**
Ideas/Interests:	**Courseware development collaboration** **Authoring-systems conversion** **Staff development seminar courses** **consultation** **Beta testing**

Authoring systems

Name:	**Peter A. Johnson**
Address:	**97 Winthrop St.** **Augusta, ME 04330**
Telephone:	**(207) 622-2535**
Affiliation:	**Student at Bentley College** **Brook 105-Bentley** **Waltham, MA 02254**
Areas of Expertise:	**Enthusiasm** **Learning**
Ideas/Interests:	**Laser-disk RAM and ROM** **Expert systems in education**

Laser disks

Desk Accessory Opinion Poll

What are your favorite desk accessories? Do you have different accessories for different applications? Send in your list—including opinions and comments—and in a future *Wheels* issue we'll feature the desk accessories most in use.

What are YOUR favorite desk accessories?

Here are the ones in my menu at this very moment:

Alarm Clock
Calculator
Chooser
Control Panel
Coordinates (for tracking the coordinates of the mouse pointer)

Note Pad
Scrapbook

Take a look at all those fonts.

DAFont—This desk accessory has three features: 1) **Font Display** shows you a sample of all of the fonts that are in your System Folder, in all of their sizes; 2) **Font Info** tells you the name and size of all of the available fonts, along with their storage size (in bytes), their Fnum, and their Font ID; 3) **Desk Accessory Info** displays the ID, number of bytes used, and the name of each of your desk accessories. This desk accessory was created by Ken Winograd, 2039 Country Club Drive, Manchester, NH 03102. It is shareware and is available on many of the electronic networks and through local Macintosh user groups. Users/adopters can send along a donation to Mr. Winograd.

Delete files and rename files from within an application.

Extras—This is a very useful desk accessory. It adds an extra menu item that lets you do the following from within any application: delete a file, rename a file, see how much disk space is still available, see how much memory is available, compact the available memory in the Macintosh for greater efficiency, quit to another application, display invisible files in the scrolling windows, and much more. Extras is available on many of the electronic networks as well as from local user groups. It was written by Bob Luce, 324 East Shaw, Fresno, CA 93710. He suggests that it be copied and distributed freely. If you like it and want to use it, send along $10 to the address above for a user license.

Key Caps—This is the new version of Key Caps, which allows you to look at a keyboard representation of any fonts available in your system. When selected, a new menu is added to your menu bar that contains a list of all available fonts.

Send in your favorites.

What are your favorites? Which ones do you use the most? Where did you get them? Please send your thoughts along. We will create a Top 20 list of Macintosh desk accessories.

Macintosh Use at the University of Chicago

The University of Chicago's Department of Computer Science is committed to the programming environment provided by the Macintosh for a growing number of its undergraduate courses. In fact, a two-quarter introductory programming course that uses Macintosh Pascal (CS 103 and 104) is so popular that the department offers 10 class sections. Students who lack a substantial mathematics background often take this course to gain a fundamental understanding of programming concepts (top-down design, algorithms and problem solving, and so forth) without having to devote the considerable effort required to learn to use an editor, operating system, and Pascal compiler on a mainframe.

Macintoshes are used in the Introductory Pascal course.

The course has been very successful in attracting humanities and social science undergraduates to computer science, who previously were either simply reluctant to deal with computers or overwhelmed by the prospect of working on larger machines. Macintosh Pascal allows the faculty to concentrate on the problem-solving and programming aspects of the course, rather than on how to deal with a mainframe operating environment. And Macintosh Pascal's multiwindow environment also facilitates the practice of testing and program debugging.

An attractive course was designed for humanities and social science students.

Another introductory course under development will also use Macintosh Pascal. Called Computer Programming as a Liberal Art (CS 110), the course will debut during the summer of 1986. It will be a conceptually rigorous course oriented especially toward humanities and liberal arts students. Its purpose will be to teach students to think about the meaning of programming techniques and technology reflectively, as well as to teach them to program.

In addition to this introductory programming sequence, the department is using the Macintosh implementation of the Scheme language (MacScheme, from Semantics MicroSystems of Beaverton, Oregon) in several of its more advanced courses (including CS 107, an introduction to artificial intelligence and further programming principles, offered by Stuart Kurtz; and CS 221, programming languages, offered by Jim Royer). The department is also in the process of designing introductory programming courses that will use MacScheme—a statically-scoped, LISPlike language—as the first computer language to be taught (rather than Pascal). Our initial reaction to MacScheme is very favorable, and we expect further refinements in the system over the next several months that will help our instructional efforts.

Scheme is used in some more advanced courses.

Another new course in development will probably also involve the Macintosh. This course—an interdisciplinary effort involving mathematics, computer science, statistics, and other components—will focus on quantitative ideas and analytic methods.

The Macintosh lab will soon be connected to the campus network.

The department has a Macintosh laboratory for the use of its undergraduates. This lab is being moved to a larger campus building, which is being renovated, and more Macintosh systems, LaserWriter printers, and hard disks are being added. Since the department is committed to UNIX and UNIX-based machines for its general-purpose computing and research (it operates a Pyramid 90X, VAX 750, AT&T 3B15, and ten Sun 3 workstations, all running UNIX variants), we are currently evaluating local area network file servers that we can use to connect our laboratory Macintosh computers and LaserWriter printers (over the AppleTalk™ Personal Network) and to provide a gateway to our departmental (and campuswide) Ethernet.

There are plans to move to the Macintosh Plus.

Plans call for the department to upgrade its existing systems to full Macintosh Plus capabilities (a mixture of 1- and 4-megabyte units) during the current fiscal year, and to double the total number of Macintosh computers available to our students over the course of this fiscal year and the next. In addition to instructional support, Macintosh systems are used extensively in the department to serve faculty, administrative, and graduate student needs for word processing and light-duty computing.

For more information about the department's Macintosh usage and plans, contact:

Don Crabb
Director of Instruction and Laboratories
Department of Computer Science
University of Chicago
Ryerson Hall, 1100 E. 58th Street
Chicago, IL 60637

PathMAC

This is a very impressive system that ties an authoring system, the Macintosh, and a videodisc player together into an educational tool that will have great impact on teaching over the next several years.

Creating a new learning environment.

PathMAC (aka: Pathology Microcomputer-Assisted Courseware) is an experimental teaching laboratory whose goal is to create a learning environment to assist medical students in two areas: developing the skills necessary for medical problem solving, and assimilating the constantly increasing body of medical concepts and information. It was created by Daniel R. Alonso; M.D., Andy Diamond, CUMC '88; and Steven M. Erde, Ph.D.

To accomplish these aims, it was necessary to represent the large body of data—both visual and textual—in a "user friendly" manner, so that it wouldn't require a major time investment just to learn to use the system. With this goal in mind, we chose to work with the Macintosh computer and the Panasonic laser-disc system.

The user interface of the Macintosh is easily accepted and mastered by

even the most computer-phobic student. The laser-disc system allows the storage of 24,000 still frames of high-quality color video images, with a worst-case access time of less than a second. Another major advantage is that the WORM technology (Write Once Read Many) allows us to master our discs in-house and constantly add images to the data base of normal and pathological micrographs, gross specimens, X-rays, and CAT and NMR scans. The PathMAC software was in part developed in-house, as well as in collaboration with outside developers. It is described briefly below:

24,000 still frames can be stored.

Carousel is a slide-projector emulator program that has allowed us to replace the 35mm slide sets that were previously used by the students to review pathology pictures. This program accepts standard Macintosh text files that contain a series of frame numbers of images on the laser disc, followed by a question and then an answer. The program reads the text file, shows the student the particular frame on the laser disc and then prompts with a question. If the student clicks on the answer button, the answer is displayed. The student can also opt to advance to the next slide and question without the answer becoming visible. The cycle continues until the end of the "carousel," but the student may back up and review at any time.

It easily replaces the 35mm projector.

Lecture Notes is a transcript reader that allows an instructor's slides to be linked with the student-generated transcript of a lecture. All that's needed is a frame number enclosed by two bullets (for example, •50•) anywhere in the line of text. As the student scrolls the text into the window, the appropriate video image appears on the monitor.

PathMAC Glossary is a desk-accessory data base of medical terms, and normal values and descriptions for many tests that are performed in the hospital. Because it's a desk accessory, it's always available while students are working on the PathMAC system, whether they're using MacWrite to prepare a transcript of a lecture or trying to solve the mystery of the CPC (discussed below). The data base currently contains close to 400K of medical information.

This desk accessory provides instant access to medical terms.

The Clinico-Pathological Conference (CPC) is an exercise in diagnostic problem solving that attempts to train students to sift through masses of clinical and laboratory data and develop a list of possible disease entities that could produce the particular constellation of symptoms and signs. We are using the Mentor authoring language by Edudisc to produce the CPC exercises, as well as self-assessment modules for the pathophysiology course called PathQuest. Mentor is the only authoring language that completely embraces the Macintosh user interface and provides access to all the system's potential as a learning tool.

The Edudisc authoring system is being used.

The problems of storage and distribution of courseware have been solved by the use of the Lutzky-Baird's Ultra-Office. Ultra-Office is a UNIX-AppleTalk file server that allows each student to have the equivalent of a 2.4-megabyte virtual disk, which can be updated with new lessons on a regular basis.

For information, contact:
Pathology Microcomputer Teaching Laboratory
Department of Pathology
Cornell University Medical College

MacNET

Definition

The MacNet project is dedicated to the integration of Macintosh personal computers and future Apple products into the Carnegie-Mellon University campus network.

Goals

The goal is to connect Macintosh computers to other university resources.

The primary goal of this project is to enable the connection of a single Macintosh personal computer, a cluster of personal computers, and a network of personal computer clusters to the university computing network. This would allow Macintosh users to share in the rich network resources available on campus, from file service to bulletin board access.

How It Works

Macintosh personal computers and peripherals will be arranged in AppleTalk clusters. Then, several such clusters will form a star-shaped network through an AppleTalk hub. The resulting network will attach to the campus internet via a gateway, which will serve as a mediator between the two networks.

The hub is a signal-level mechanism that's being developed in conjunction with Dartmouth. It will provide for a minimum connection ratio of 7-lines-in-to-1-line-out, and consist of a single, self-contained PC board.

The gateway hardware used in this scheme has been developed by Lawrence Butcher of C-MU's computer science department. The software has been adapted from the "Seagate" code written by Bill Croft of Stanford University. John Zsarney is working on a port of Bill's code to the Macintosh. The gateway provides routing between IP and AppleTalk DDP nodes, as well as AppleTalk/IP encapsulation.

Features

File service for the Macintosh will use a UNIX machine as the server.

MacNet will facilitate transparent file service for the Macintosh using a UNIX machine as the server. We chose a Macintosh-to-UNIX interface because C-MU already operates a campuswide distributed file system, called "VICE," based on a UNIX 4.2 BSD. VICE has a well-defined network interface for personal computers, which MacNet will exploit.

Other attractive features are print spooling to the LaserWriter or ImageWriter™ printer using a 4.2 machine as a server; mail service, using VICE as a post office; and bulletin board service, using VICE as a central repository.

MacNet applications foster use of the internet by novices, because Macintosh applications have an inherently friendly form of interaction.

Applications

Three programs—CUSTOMIZE, Telnet, and TFTP—have been developed to allow Apple Macintosh computers on an AppleTalk network to communicate with other computers on the campus internet. CUSTOMIZE manages a site-specific file that contains information for use by the other programs. The Telnet application allows the user to log on to any host system for which the user has an account if the host provides Telnet service (as most TCP/IP hosts do). The TFTP (trivial file transfer protocol) program is used to transfer files between the Macintosh and other internet sites.

Custom programs have been developed to allow Macintosh network communications.

As the project progresses, Macintosh-specific devices such as the LaserWriter will be made available to non-Macintosh machines. Mail and printing applications are also under development.

For more information, contact:
Carnegie-Mellon University
Center for Art and Technology
(412) 268-3454

CAI User Groups?

The State University of New York/College at Old Westbury is in the early stages of developing a full-scale academic computing center. The intent is to serve the needs of faculty and students across the curriculum. A large Macintosh 512K lab is already in use.

Are you interested in computer-aided instruction?

Representatives there are extremely interested in making contact with any active networks, bulletin boards, mailing lists, publications, or user groups that serve educators interested in CAI (computer-aided instruction) for the Macintosh.

If you know of any such contacts, please contact:
Michael E. Taves
Assistant Director, Software
State University of New York/College at Old Westbury
Long Island, NY 11568

Data Acquisition and Control

In the Department of Psychology at Dartmouth College, an experimental animal laboratory was successfully automated with the help of Small Business Computers of New England.

Mice control rats.

In the laboratory, rats live in four individual chambers, 24 hours a day, for months at a time. The goal was to design and automate an experiment involving meal patterning, and the rats' task was structured as follows:

(1) Initially, the rat must press a lever a certain number of times (a controlled variable) to turn on a light within its chamber. The light signals the availability of food.

(2) Subsequent bar presses (a controlled variable) operate a feeder that delivers food pellets to the rat. The rat can continue to press for pellets for as long as it likes. The light in the chamber stays on for the duration of the meal.

(3) If the rat allows a certain number of minutes to pass (a controlled variable) without pressing the bar, the light goes out, the meal ends, and the rat returns to the beginning of the procedure.

Thus, each chamber has a bar press, a light, a feeder, and an option for future use. And the data to be recorded daily includes all meal-related statistics (for example, time spent in each phase and number of presses).

This system allows direct data acquisition by the Macintosh.

The system was designed with a Macintosh, a Taurus ONE/5 Data Acquisition peripheral with 64 channels of digital input/output (for the four chambers) and rack-mountable termination panels. The software used includes Microsoft Multiplan and BASIC, and MACCONTROL (from Small Business Computers of New England). The Taurus provided the hardware interface for all signals from all chambers, connecting to the Macintosh via the modem port. Dartmouth completed a MACCONTROL application template using Multiplan, and MACCONTROL did the rest. The application was up and running in hours.

For more information, contact:
Small Business Computers of New England
P.O. Box 397
4 Limbo Lane
Amherst, NH 0303
(603) 673-0228

The Model Neuron Simulator

Exploring neurobiology.

The Macintosh Model Neuron simulator was designed as a supplement to lecture material. It is not a tutorial program; rather, it is a means for exploring neurobiological questions much as you would in an actual laboratory setting. Along the way, it teaches a basic understanding of how laboratory equipment works and how to design meaningful experiments.

Overview of the Simulator

The simulation program incorporates the three essential components of neurobiological experiments: the cell whose behavior is to be studied, various means of stimulating that cell, and a device for recording the cell's response to stimuli. All three of these components are quite flexible; the various options at your disposal are explained in this article.

When you start up the program, five windows should appear on the screen. The untitled Stimuli and Recorder windows and the titled RP(mV) window are always visible, but the Solutions and Membrane windows overlap one another so that you can only see one at a time. It's easy to switch between those two windows, however—just click in the visible portion of the background window to bring it into full view.

Nearly all of your manipulations and their effects will appear in one of these five windows. The major exceptions are the Inject menu, used to choose between current-injection and voltage-clamp experiments, and Quit in the Control menu, which should be chosen at the end of a session before turning the machine off. You can safely ignore the Toxins menu at first, but later you will be using it to observe the effects of various neurotoxins on your model cell.

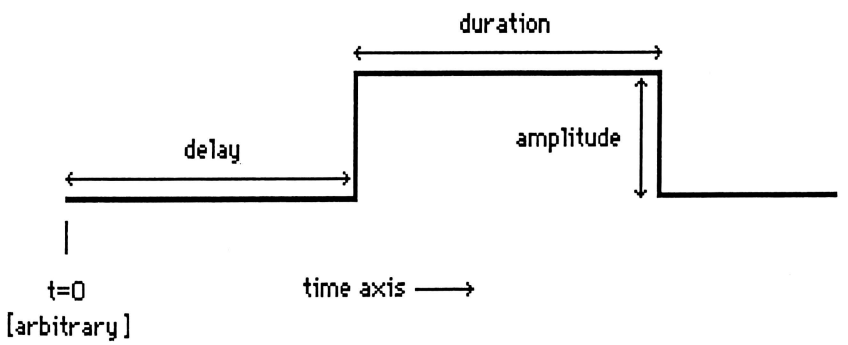
This simulator, like all models, is a simplification of real-world phenomena. For example, the cell modeled here is assumed to have a spherical shape and homogeneous membrane. Clearly, such a cell will not be found in real biological systems, but the principles that apply to the model cell apply to real cells as well. The simulator also lacks a number of useful controls and features (for example, pulse-train stimulus capabilities and adjustable dosages of toxins). Finally, the model cell's dynamics are based on those of the frog muscle, so the actual numbers produced by the program are of limited application to other species, especially invertebrate ones.

Like all simulations, this is a simplification of real-world phenomena.

Stimulating the Cell

This simulator allows you to use three different types of stimuli simultaneously: electrical, excitatory chemical, and inhibitory chemical. Electrical stimuli may be either an injected current pulse or a voltage clamp. (You must choose one or the other for any given experiment—not both. Toggle between current injection and voltage clamp by choosing their corresponding items on the Inject menu.) Two chemical stimuli are also provided: acetylcholine (excitatory) and GABA (inhibitory). All stimuli are treated as square pulses that you can alter independently.

Figure 1. Specification of Stimuli



Stimuli are specified by adjusting three parameters: amplitude, delay, and duration. Or in plainer English, you need to set the strength of each stimulus, the time it is to begin, and how long it is to last. Scroll bars are used to set each parameter; the current setting of each scroll bar is shown beside it, and units are shown automatically.

As you experiment, you will appreciate the model's flexibility.

This method of adjusting stimuli is exactly like that employed by commercial stimulators. It may seem complicated at first, but as you experiment, you will appreciate its flexibility. (Note, for instance, that if you don't want to use a particular stimulus in a given experiment, you can simply set its amplitude to zero, and the values you choose for its delay and duration won't matter. Also note that the primary electrical stimuli—current and voltage pulses—may be positive or negative in amplitude, but chemical stimuli must be nonnegative in amplitude.) One problem posed by this setup is that it is often difficult to visualize your stimuli, which are essentially treated as nine numbers by the program. We have tried to mitigate this problem somewhat by providing one-millisecond time indicators on the recorder and by limiting the stimuli to square pulses.

Once you have set the nine scroll bars to appropriate values, you need only push the Go button to run your experiment. The simulator requires about 15 seconds to draw an entire trace, so the Stop button is active while an experiment is running. This button allows you to break out of the experiment—for instance, to change display scales or alter some membrane parameter. It is not functional except when an experiment is being run.

Using the Recorder

The recorder resembles a laboratory oscilloscope.

The recorder resembles a laboratory oscilloscope, displaying the course of a signal's amplitude over time. The bulk of the Recorder window is an output screen whose horizontal axis is calibrated in milliseconds, and whose vertical axis measures voltage (± from resting potential) during current injection experiments and current (± from zero) during voltage clamp experiments. The screen's sensitivity along the vertical axis may be changed to high, medium, or low by pushing the H, M, or L button on the recorder. The three scales are each separated by one order of magnitude, that is, H is 10 times more sensitive than M, which is in turn 10 times more sensitive than L. High sensitivity will be necessary for detecting MEPPs, and low sensitivity will be necessary to fit large events such as action potentials on the screen. You will probably use high sensitivity for most voltage-clamp experiments.

Several waveforms can be displayed on the screen simultaneously.

Several waveforms can be displayed on the screen simultaneously, a capability that can be valuable in performing controlled experiments. If you find that old waveforms are confusing or simply no longer needed, just press the Clr button to clear the screen. The screen is cleared automatically when you change the recorder's sensitivity or toggle between current-injection and voltage-clamp modes, to prevent misinterpretation of the screen's contents in those situations. (That is, it is meaningless to compare the results of current-injection and voltage-clamp experiments, so the screen is cleared as a convenience when you change modes.)

The mouse is used to make measurements on the output screen. Click anywhere; the voltage (or current) and time corresponding to the location you clicked on will be displayed at the bottom left corner of the scope. The two other numbers at the bottom right corner measure the differences in voltage (or current) and time between that click and an on-screen benchmark. This benchmark is the small rectangle initially placed along the left edge of the screen. You can move it by double-clicking anywhere inside the screen and readily make difference measurements relative to the new location. (Suppose, for example, that you wanted to measure the amplitude and time differences between the peaks of two waveforms. You could move the arrow cursor to one pulse's peak and double-click to put the benchmark there and then click once on the other peak, reading the differences between the two peaks directly.) As with the stimulator, correct units are provided for you automatically.

The mouse is used to make measurements on the output screen.

There is one possible complication to using this measuring scheme. Suppose that you produce one waveform and then change the cell's resting potential. Any more waveforms that you produce will be displayed relative to the new RP, rather than the RP used in generating the first waveform. Thus, comparisons between two or more waveforms may not be valid (if the RP has changed).

Modifying the Cell and Its Environment

The model cell's membrane may contain varying numbers of five different channel types: resting, voltage-dependent potassium [K(V)], voltage-dependent sodium [Na(V)], Ach, and GABA. The density of channel types may be modified with the five respective scroll bars in the Channels window. The numbers underneath each scroll bar indicate the density of that particular channel type per square micron of membrane. All channels are assumed to be distributed equally within the membrane; that is, any piece of the cell's membrane is assumed to have the same proportion of channels as any other piece.

You can also modify the solutions inside and outside the cell by using the mouse to operate the six controls in the Solutions window. The numbers displayed in this window indicate the millimolar concentrations of potassium, sodium, and chloride ions inside and outside the cell. Each control is independent, so even biologically implausible cells (for example, cells with very high concentrations of all three ions inside and very low concentrations outside) can be modeled in practice.

You can easily modify the solutions.

When you begin the program, a set of values for the controls in both the Channels and Solutions windows is provided as a default, for example, the density of resting channels is set initially to 5 per square micron. Those default values are similar to those typically found in vertebrate muscle cells, and they are provided mainly as a convenience. You can, of course, change any of those values and observe the results of your manipulations on the screen.

The cell's resting potential, in millivolts, is displayed in the small RP(mV) window. The number is calculated using the Goldman equation; accordingly, note that varying the intracellular or

extracellular potassium or sodium ion concentration changes the resting potential, but that it is unaffected by chloride changes. The RP(mV) window displays a critical piece of information but is not used to manipulate anything.

Finally, a few words should be said about the Toxins menu. Three toxins—TTX, TEA, and BTX—may be applied to the cell, each of which is assumed to inactivate all membrane channels of a specific type but otherwise to have no effect on the cell. Briefly, TTX inactivates voltage-dependent sodium channels, TEA inactivates voltage-dependent potassium channels, and BTX inactivates acetylcholine channels. Selecting a toxin from this menu once will apply it to the cell, and selecting it again will remove it. Alternatively, you can clear the cell of all toxins by choosing No Toxins from the menu.

Here are a few random notes about the Model Neuron simulator, Version 3.x. (In the file's present form, LaserWriter fonts will give the best-looking output.)

The program was written using NEON (Version 1.5).

• This program was written using a beta version of NEON 1.5, which is a novel—and quite flexible—Macintosh development environment that requires a minimum of 512K. However, applications written in NEON have two related limitations of which you should be aware: they can't be made into startup applications, and they can't run under the Switcher™ program. (These limitations will disappear around May or June.) The speed of drawing the output trace can be blamed on the infernally slow SANE, but all other traces of flakiness must be blamed on the programmer/designer. To the best of my knowledge, the program is stable in its current form.

Feedback is welcome!

Further enhancements will depend on the feedback obtained from other users. We're thinking about three additions: a more flexible scope-scaling mechanism, double-pulse capabilities, and on-line help. If you use the program, please write with suggestions for improvement, especially those that would make the program more valuable as a teaching tool. (For example, was the emphasis on mimicking laboratory equipment well-placed or inappropriate?) Also feel free to write if you come up with a neat way of using the program.

Sudents seem to master the program quickly.

• The documentation for Model Neuron is pretty terse, but we've found that students master the program quickly if given a brief demonstration and the opportunity to take the disk and the documentation home to experiment with. We might expand our documentation a little by adding screen dumps, but if anyone wants a tutorial, WRITE ONE and send it in; you will be repaid with the knowledge that you've spared another human being the terrors of writing for a captive audience.

Please address correspondence to the author:

Barry Polley
E503 MVR—Dept. D&EA
Cornell University
Ithaca, NY 14853

College of Wooster Dorm Network

The College of Wooster is committed to developing its campus computing resources. Among its goals in this area is to create an all-campus seminar network, specifically designed for a liberal arts context. Last summer, the Ohio college took its first major step—establishing a prototype network in a single campus residence hall.

Right from the start, students became involved in the project, using off-the-shelf equipment to configure and install the experimental network in August. The network connects 60 rooms in the Douglass Residence Hall, enabling its use by a possible 120 students. Students will purchase the Macintosh systems; the AppleTalk cables, file server, and laser printer were provided by the college, with the help of a grant from the Rubbermaid Corporation in Wooster.

Three additional campus residence halls will be wired this summer.

Plans for the coming summer include wiring three more campus residence halls, and installing and testing ten faculty workstations. In addition, three writing center stations and three micro center workstations will be established; each on a separate AppleTalk network, but connected by Sytek interfacing units to the campus's broadband interactive cable network (WoosterNet). The following summer will see the addition of ten more faculty workstations, four residence-hall networks, four LaserWriter printers, additional Macintosh systems, and file servers and bridge units to connect the existing networks.

In three years, all ten residence halls will have local area networks.

At the end of three years, the College of Wooster plans to have functioning local area networks in every one of its ten residence halls and seven academic buildings. The program will be formally evaluated during the 1987–88 school year.

This ambitious effort has already received a "Hero Award" from Apple. A feature that Apple found most impressive was the fact that the college students were the ones actually implementing the plan—establishing the prototype network themselves.

ScholarNet
An Academic Computing Network

This service facilitates communication among scholars and professionals in the humanities and social sciences.

ScholarNet is a new electronic networking service that helps scholars and professionals in the humanities and social sciences communicate with each other. The system is designed to link academics in more than 65 countries, including Canada, Australia, Israel, and New Zealand. The network effectively extends subscribers' range of contacts from those within a single department, library, or campus, to peers anywhere served by Tymnet or Uninet.

The ScholarNet service began last fall with funding from North Carolina State University at Raleigh (headquarters for the system),

and from Brooks/Cole Publishing and Wadsworth Publishing. Directed by Dr. Richard W. Slatta, associate professor of history at North Carolina State University, ScholarNet is divided into two segments: PoliNet, directed by Michael L. Vasu, which covers political science, public administration, and criminal justice; and HumaNet, directed by Dr. Walter Meyers, for scholars in the humanities.

Users can customize services to meet their specific needs.

Each network includes a variety of topical forums. Because of the system's flexible, interactive nature, users can customize offerings and services to meet their specific needs.

ScholarNet will greatly facilitate joint research projects. In addition, national and international organizations can post newsletters and meeting schedules electronically. Book and software publishers may wish to list notices of new journals, books, and programs, and to let subscribers order books or software on-line.

It is also a valuable resource for businesses.

The service will also be a valuable resource for businesses; a company considering overseas investments would do well to arrange consultations with area studies experts on HumaNet or PoliNet.

A one-time subscription to PoliNet or HumaNet costs $29.95 for an individual or $100.00 for an academic department or corporation. (For corporate accounts, a number of subaccounts may be administered for individual billing.) Hourly rates are $18.50 from 7 A.M. to 6 P.M. on weekdays and $9.50 during off-hours.

To use the service, subscribers need a microcomputer or terminal, communications software, a telephone line, and a modem. ScholarNet levies no extra charge for 300- or 1200-baud service (which makes it among the least expensive 1200-baud services); access at 2400 baud is available with an hourly surcharge.

The subscription fee includes a gateway to all services of Delphi, ScholarNet's host system. A service of General Videotex Corporation, Delphi includes a wide range of recreational and business features. ScholarNet subscribers also have another gateway to the many data bases of DIALOG Information Services (surcharge). In addition, PoliNet subscribers can access HumaNet and vice versa, and subscribers will also have access to future networks planned for other disciplines.

Everyone can get up-to-the-minute news on developments in their areas of expertise.

The network is a great equalizer, allowing everyone to get up-to-the-minute news on developments in their areas of expertise. By offering a service that is very easy to use, inexpensive, and customized to the needs of the academic community, ScholarNet's creators hope to bring new communications power to scholars everywhere.

For further information, contact:
Richard W. Slatta
ScholarNet Director
North Carolina State University
Raleigh, NC 27695-8101
(919) 737-7908 (MWF)
CompuServe 70156, 404; or "Polinet" on Delphi

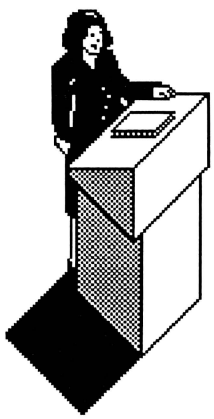
Send subscription requests directly to General VideoTex Corp., 3 Blackstone Street, Cambridge, ME 02139; or call 800-544-4005. Include a credit card number and expiration date for individual subscriptions, and a full list of users for corporate accounts.

A Friendly Reminder

Please remember to send us any or all of the following:

- Your list of **favorite desk accessories.**
- Your personal information for **Work Not Yet in Progress.**
- Information about any **Macintosh projects** that you are working on.
- A list of your **favorite applications.**
- A kind word about *Wheels for the Mind.*

Please respond!



New from Apple

News from AppleWorld

The AppleWorld Conference, held in January, united 2,000 computer-industry decision makers to consider Apple Computer's interests and intentions. The San Francisco event focused on various markets—including higher education—and featured workshops, breakout sessions, and speeches by, among others, Apple's John Sculley, president and CEO; Bill Campbell, executive vice president, U.S. Sales and Marketing; and Burt Cummings, university sales manager. The following is a brief synopsis of these speeches:

Information is doubling every two and a half years.

- John Sculley spoke of the incredible rapidity with which information is accumulating. He cited a previous speaker's comment that information is doubling every two and a half years, and that students simply couldn't be expected to cope with such an "information explosion" without learning how to manage information in order to make decisions.

  With this in mind, Sculley said that making decisions and *communicating* them were the crucial issues. He said that computers were a means to improve the organization and presentation of information so that we can move forward to create a better society. Toward that end, he summarized Apple's intentions as the following:

Look for a Macintosh-based workstation in the future.

  —To have a strong Macintosh product line, including a future Macintosh-based workstation.
  —To broaden operating-system offerings with UNIX, incorporating user-interface enhancements drawn from the Macintosh.
  —To integrate Apple computers into universities' larger information environments.
  —To continue to support curriculum development.

Apple will support the university market.

- Bill Campbell's main theme can be summarized in two words: "We're listening." He talked about Apple's efforts to support the university market—including the Academic Courseware Exchange program, and backing for university software and hardware development projects that explore the use of Apple products in higher education.

- Burt Cummings mentioned Apple's sponsorship of such academic gatherings as the Midwest Academic Computer Conference at Washington University, Computers in the Liberal Arts at Reed College, and developers' conferences in San Jose and Boston. He spoke of the company's intention to hold more such conferences, both national and regional.

  Cummings also talked about Apple's major effort to keep higher-education institutions in touch with what's going on—yes, that's right, *Wheels for the Mind.* He pledged Apple's continued support for this (mammoth) project, and offered thanks to all the University Consortium member schools for the wealth of information and ideas that the group has generated.

***Kudos for* Wheels.**

In addition to the preceding, several articles in this section detail announcements made at AppleWorld that may be of interest to Consortium members.

Macintosh-Based Audit Support System

In January, William L. Gladstone, chairman and managing partner of the international accounting firm of Arthur Young, announced the introduction of an integrated audit software system using the Macintosh personal computer.

The integrated series of microcomputer-based software tools, called Arthur Young/ASQ (Audit Smarter, Quicker), will impact every phase of the audit, from initial planning to execution of audit procedures to completion of financial statements and corporate tax returns. The announcement of the software system and Arthur Young's choice of Macintosh for its auditors was made at the AppleWorld Conference.

"We are entering an exciting new era in auditing," said Gladstone. "Our AY/ASQ audit automation system represents a radical change in the use of computers for auditing and differs significantly in the broad range of fully integrated capabilities it provides. The system represents two years and 50,000 hours invested in development and testing. When the new system is implemented in the firm's 88 domestic offices in mid-1986, auditing will never be the same again!"

With the release of AY/ASQ, Arthur Young becomes the first major CPA firm to incorporate expert systems technology into the audit planning process. Using newly developed and tightly linked data bases of audit procedures, financial statement assertions, and internal control objectives, the AY/Decision Support module guides auditors in preparing an individualized plan for each audit.

Expert-systems technology is being incorporated into the audit process.

The system contains other modules that will free the auditor from many of the mechanical tasks associated with an audit and integrate such functions as data management, graphics, word processing, and telecommunications.

Peat Marwick to Upgrade

More than 5,500 Macintosh systems already installed.

Also at AppleWorld, Peat Marwick, the international professional accounting firm, announced a program to upgrade its more than 5,500 Macintosh microcomputers to match the capabilities of the recently introduced Macintosh Plus computer.

"This new development is one more step in the evolution of our long-term commitment to improve our productivity and the quality of the audit by utilizing the latest in computer technology," said John D. Collins, partner in charge of auditing, long-range planning, and research in Peat Marwick's Department of Professional Practice.

Peat Marwick increased its productivity by introducing the use of microcomputers in 1984 to automate nonjudgmental facets of the audit process. It expects to have its updated microcomputers on-line by August 1986.

The upgrades will offer Peat Marwick greater storage and more functionality and allow optimum usage of both its proprietary and commercial auditing software.

The increasing computerization of the audit process, Collins said, has enabled Peat Marwick's auditors to spend more of their time on substantive judgmental issues and advisory and problem-solving tasks for clients.

Macintosh Gains Acceptance in Business

Macintoshes are being used for ...

More and more companies are turning to the Macintosh personal computer, LaserWriter printer, and AppleTalk Personal Network to meet their business computing and printing needs. The following examples demonstrate the wide variety of ways that businesses are using Apple's products.

...printed circuit board layout, tooling design, project scheduling...

The **Motorola** Microelectronics and Portable Products divisions are using several hundred Macintosh computers for a wide range of engineering and office automation applications, such as printed circuit board layout, project scheduling and tooling design, as well as business productivity applications, like word processing, presentation graphics, and spreadsheets.

The systems in the Microelectronics Division are linked via an OmniTalk network, enabling employees to share files and LaserWriter printers. According to Pat Guertin, section manager, "We used to buy a lot of PCs; however, since the Macintosh computers have proven

themselves, I don't think we're buying that many anymore. People like the Macintosh."

Federal Express is using Macintosh computers at its Memphis, Tennessee, headquarters for graphics, communications, and data-management applications. For example, the Information Services group converts operational data relating to the company's huge fleet of aircraft into comprehensible drawings and presentations using MacDraw™ and Microsoft Chart software. To access data for preparing budgets and forecasting reports, the Methods Engineering/Long-Range Planning Department uses Macintosh systems and an AppleLine™ link to an IBM mainframe computer.

...graphics, communications, data management...

Knight-Ridder Newspapers (KRN), publisher of 28 papers nationwide, is incorporating more high-quality maps, charts, graphs, and line drawings into breaking news stories thanks to its Knight-Ridder Graphics Network. Newsroom artists use MacDraw and Microsoft Chart software to create original drawings that then become part of a computerized graphics library. The library is available to each paper via an electronic mail and bulletin board system. Artwork can be downloaded and printed in camera-ready form on Apple's LaserWriter printer, or it can be modified before it's printed to fit local requirements. A pilot program with eight sites, KRN plans to expand the Network to all of its papers by next month.

...designing high-quality maps, charts, graphs...

"The LaserWriter is the key," according to Roger Fidler, KRN's director of graphics and newsroom technology. "It has true type fonts, the ability to lay down screens, and it gives us copy that we can reproduce and paste down without going through any additional steps. The closest competitors are systems that cost about $120,000 for a single workstation."

The audit department of **Arthur Young**, one of the Big Eight accounting firms, is using Macintosh computers to streamline the compilation of notes and spreadsheets into professional-looking reports. Field auditors carry Macintosh systems to clients' offices to develop drafts of management letters, financial statements, and working papers. Disks circulate for review, modifications and approvals, and are then used by the firm's report department to produce final text, graphs and financial tables from a LaserWriter. An AppleTalk network, which is available to the entire audit department staff, allows the auditors to exchange information with a network of Eagle and Zenith computers in the company's tax department via a network bridge.

...compiling notes, management letters, spreadsheets, financial statements...

Many different computerized systems have been used to assist in the launch processing of the Space Shuttle at the Kennedy Space Center. **Rockwell** International Corporation's Launch Support Services Division is aided, among others, by 16 Macintosh computers.

...launch processing of the Space Shuttle...

Detailed drawings, down to positions of nuts and bolts, are transferred via AppleLine to and from a mainframe computer at Rockwell International's Southern California headquarters. An AppleTalk network aids in the utilization of three LaserWriter printers and accommodates third-party file and communications servers, which are currently being evaluated.

Each Macintosh is equipped with a basic hardware/software package that includes Apple's Hard Disk 20, Lotus Jazz, and Microsoft Word, File, and Excel. MacDraw and a Hewlett-Packard color plotter are used for creating graphics. A Project-a-Mac system enlarges Macintosh screen images to wall size and allows real-time input from other Macintosh computers. In addition, a Mac Magic system creates a videotape archive of historical documents.

Why Macintosh? Its ease of use leads to a minimum amount of training and higher productivity of personnel.

...and producing the monthly newsletter

The **Chevron** group responsible for supporting the more than 2,300 personal computer users throughout the company recently installed Apple's desktop publishing products to produce its monthly newsletter. Previously, newsletter text was generated on a mainframe, and neither graphics nor offset printing were possible within the newsletter's deadlines. Now, using Aldus Corporation's PageMaker software, the publication has changed considerably in appearance. This change is increasing readership, according to Mary Neff, the newsletter's editor. She reports that the first Macintosh/LaserWriter-generated issue prompted dozens of calls from Chevron people interested in the Apple Macintosh/LaserWriter system's desktop publishing capabilities.

Consultant to University Marketing

Apple Computer has announced the appointment of Dr. Brian Hawkins to the position of university resource specialist for Apple's university marketing group.

Apple's university resource specialist.

Dr. Hawkins, associate vice president for academic affairs and associate vice president for computing at Drexel University in Philadelphia, is taking an 18-month leave of absence from the university to act as a resource to colleges and universities interested in expanding computing on campus.

Dr. Hawkins was instrumental in setting up the microcomputing program at Drexel University, which is recognized nationwide as a leader in the integration of microcomputing in higher education. The school has developed nearly a hundred academic software applications used throughout the curriculum.

New Support for User Groups

User groups take notice please!

At the AppleWorld Conference, Apple Computer officially recognized its longstanding relationship with personal computer user groups by announcing the establishment of a support program designed to promote better communication between it and the nearly 600 Apple user groups nationwide. With this ongoing support program, Apple is publicly acknowledging user groups as a valuable component of Apple's sales and support strategies.

More than 200,000 members strong, Apple user groups meet regularly to exchange information on the use of Apple products. Originally characterized as clubs for hobbyists, the groups have changed over the years to include special-interest groups that parallel each of Apple's customer segments: business, education, and consumer.

There are over 200,000 user group members!

The support program is expected to facilitate exchange of information between Apple and the user groups, and to result in the formation of an Apple User Group Advisory Council, the strengthening of supportive relationships between user groups and dealers, and greater ability by Apple to gauge and respond to the needs and desires of the marketplace.

One of the first accomplishments of the new support program also occurred at AppleWorld—the live, on-line communication of John Sculley's AppleWorld opening address to several hundred members of the Micronetworked Apple Users Group (MAUG). As Sculley delivered his speech, key points were sent live over CompuServe. The live transmission from AppleWorld for MAUG members was an excellent (and nearly immediate) demonstration of Apple's commitment to improving its communication with user groups and end users.

"User groups have supported Apple since its inception," said Ellen Petry Leanse, Apple's recently appointed "user group evangelist" and director of the program. "Research shows that knowledge of Apple products spreads faster by word of mouth than by any other means. User group members are the greatest proponents of Apple's products. They disseminate information and offer support on our products to users from all backgrounds and with different levels of experience. We're pleased to officially recognize them as a key resource. In nurturing our relationship with them, we're building a system that benefits user groups, our dealer base, Apple, and, of course, our customers."

Apple appoints a "user group evangelist."

For further information interested user groups should contact:
Ellen Petry Leanse
Apple Computer M/S 23G
20525 Mariani Avenue
Cupertino, CA 95014

Northern Telecom Network Agreement

Northern Telecom and Apple Computer, Inc. announced an operating agreement at AppleWorld that allows Macintosh personal computers to be networked over telephone lines of widely used Northern Telecom digital PBX (private branch exchange) switches. Under the agreement, Macintosh computers can be connected to the computers and peripherals of other manufacturers over telephone wires instead of expensive dedicated data lines.

The Macintosh will be fully integrated into other systems.

"Our strategic partnership with Northern Telecom signals our commitment to integrating Macintosh technology into systems that other manufacturers have pioneered," said Bill Campbell, Apple's executive vice president of sales and marketing.

"Increasingly, Apple customers want local area networking and electronic mail capabilities for Macintosh. Our arrangement with Northern Telecom provides outstanding networking capabilities almost immediately at the more than 17,000 sites equipped with Northern Telecom's Meridian PBXs," he said. "Over the longer term, we expect to continue to work with Northern Telecom to further integrate the two companies' existing and future products."

Apple and Northern Telecom, the largest supplier of PBX equipment in the U.S., began work on their equipment interface in May with a comprehensive test program to validate Macintosh compatibility with LANSTAR, the local area network of the Meridian SL-1 and Meridian SL-100. Tests verifying successful integration of the products were completed in December.

Apple previously announced plans to integrate Macintosh computers into a variety of computer and telecommunications networks. The efforts involve three primary activities: adoption of certain industry-standard protocols, codevelopment of networking products with other companies, and development of new generations of Macintosh and accessory products.

Apple Offers Trade-in Program to Schools

A new Apple program will help U.S. schools protect the investments they've made in personal computers by facilitating their acquisition of up-to-date computer technology. The program gives schools nationwide the opportunity to trade in used computer systems on a one-for-one basis for credit toward the purchase of new Apple II or Macintosh personal computers.

Trade in that old equipment.

From March 15 through December 31, schools can trade in Apple II, II Plus, and III computers; PCjrs; Tandy II, III and IV systems; and selected Commodore computer systems, as well as additional disk drives, selected IBM typewriters, and selected computer systems from other manufacturers. The equipment must all be in working order and systems must include a monitor, CPU and disk drive.

For each returned system, schools will receive credit toward the purchase of an Apple computer system. Depending upon the make and model, credits on trade-ins can run as high as $200 for each system. To take advantage of the program, schools must order a minimum of five new Apple computers through Apple's Education Purchase Program.

"We recognize the need for schools to upgrade the quality and the functionality of their computers," said Jim Buckley, Apple's education channel manager. "Schools are making major, long-term investments in computer equipment and those investments must be protected.

Apple intends to provide schools with that kind of security. We've made a long-term commitment to helping schools integrate computers into the classroom. One component of that commitment is to provide the kind of sales that enable schools to take advantage of changing computer technology at an affordable cost."

The returned systems will be refurbished and sold as used equipment. Apple has reached an agreement in principle to sell the equipment through an independent representative—the Microcomputer Inventory Exchange, a Santa Barbara-based firm specializing in remarketing refurbished equipment. Prices will be based on *The Brown Book*, an industry guide to prices for used computers.

Inside Macintosh Available

Planning on doing some development on the Macintosh?

Addison-Wesley has added *Inside Macintosh* to its Apple Technical Library. (The promotional edition, *The Phone Book,* is no longer available from Apple.) The text can be ordered in either a three-volume paperback set or a deluxe, one-volume hardbound version. Order numbers and suggested retail prices are as follows:

— Vol. 1 Paperback 0-201-17731-5 $24.95

— Vol. 2 Paperback 0-201-17732-3 $24.95

— Vol. 3 Paperback 0-201-17733-1 $19.95

— Deluxe Hardcover 0-201-17737-4 $79.95

***Get your copy of* Inside Macintosh.**

Addison-Wesley has changed its telephone numbers. To place orders, call (800) 447-2226, or in Massachusetts, call (617) 944-8660. The new number for customer service inquiries is (800) 447-2244 or (617) 944-8660 (Massachusetts only). Please call between 9:00 A.M. and 4:30 P.M. EST.

Apple Enhances Macintosh 512K

Following are answers to the most commonly asked questions about the new system:

What is the "enhanced" Macintosh?

How does it differ from the Macintosh 512K?

The enhanced Macintosh 512K features an 800K internal disk drive in place of the 400K disk drive built into the Macintosh 512K. This doubles both the system's disk storage capacity and its disk access speed. You can store multiple software programs, data files, fonts, desk accessories, and printer drivers on a single disk. And with fewer disks to swap and manage, you can work faster.

The new system's 128K of ROM supports the Hierarchical File System, the same file system used in the Apple Hard Disk 20. This means the enhanced Macintosh 512K can support more powerful Switcher configurations and more desk accessories. It also makes it easier to work with text, numbers, and cut and paste capabilities.

In addition to those two improvements, the enhanced Macintosh 512K still features the same intuitive Macintosh user interface, high-resolution screen, and advanced graphics capabilities as the original Macintosh 512K.

How does it differ from the Macintosh Plus?

The enhanced Macintosh 512K and the Macintosh Plus are the two currently produced Macintosh computers. They differ in three features: memory, peripheral ports, and keyboard.

The Macintosh Plus has more memory...

Memory—The enhanced Macintosh 512K has 512K of RAM, compared with the full megabyte available in the Macintosh Plus. In addition, when higher-capacity chips are available, the RAM of the Macintosh Plus can be expanded to four megabytes.

...a high-speed peripheral port...

Peripheral Ports—The enhanced Macintosh 512K has the same peripheral ports as the original Macintosh 512K: a mouse port, a DB-25 external drive port, two DB-9 serial ports, and a sound port. The Macintosh Plus also features a high-speed Small Computer System Interface (SCSI) peripheral port, which can be used to connect as many as seven peripherals in a daisy chain. In addition, the serial ports on the Macintosh Plus use circular DIN-8 connectors.

...and a built-in numeric keypad.

Keyboard—The enhanced Macintosh 512K has a regular Macintosh keyboard, but the Macintosh Plus keyboard contains a numeric keypad and four cursor keys for faster number and data entry in applications such as spreadsheets and data bases.

Which Macintosh is right for me?

The Macintosh Plus is designed for the "power user," for example, a faculty member or administrator who needs large amounts of memory and expandability. It's extremely fast, powerful enough to make short work of your biggest projects, and expandable enough to grow rapidly as your needs change.

The enhanced Macintosh 512K shares many of the same attributes, but at a more affordable price. It can also be upgraded later to the full power and expandability of the Macintosh Plus. Both computers work equally well with Apple peripherals such as the ImageWriter printers, the Apple Personal Modem, the LaserWriter printer, and the Hard Disk 20.

Can I upgrade my Macintosh 512K to an enhanced Macintosh 512K?

Yes. You would need to purchase the Macintosh Disk Drive Kit (M2516) which includes a built-in 800K double-sided disk drive, new ROMs, the Macintosh Plus System Tools disk, and a guide to the new features. This kit requires dealer installation.

You can upgrade.

Does the enhanced Macintosh 512K include MacPaint and MacWrite?

No. The MacWrite and MacPaint™ programs are being unbundled from the enhanced Macintosh 512K to encourage increased third-party software support, especially in the area of word processing.

Consortium Grows by Eight Members

In March, Apple announced the expansion of the Apple University Consortium to include eight additional U.S. universities. The new members are the Massachusetts Institute of Technology, the University of California at Berkeley, the University of Illinois at Champaign-Urbana, the University of Maryland, Drake University, Duke University, Emory University, and Franklin and Marshall College. These schools will join the original AUC members in exploring innovative uses for the Macintosh personal computer, developing courseware, sharing information, and acting as an advisory council to Apple.

The more the merrier.

"The advice we've received and the development efforts that have been achieved from this program have proven extremely valuable. We now feel it's time to expand the AUC and include a broader base of universities that reflect Apple's increasing interest in and involvement with UNIX, supercomputers, networking, and computer-intensive campuses," said Bud Colligan, Apple's manager of higher-education marketing. "Our goal is to keep the consortium small enough to maintain a high-quality exchange of information, yet broad enough for everyone involved to benefit from the expertise each brings to the program."

Since its inception, the AUC program has put thousands of Macintosh computers into the hands of students on member campuses, led to the development of hundreds of courseware applications, and spawned a growing interest in use of the Macintosh for a wide range of academic activities.

Apple-Label Software Version's

Check your "About ..." menu to see if you have the latest version of your software.

Application	Version
Finder	5.1
Macintosh 68000 Development System	1.0
MacDraw	1.9
MacPaint	1.5
Macintosh Pascal	2.0
MacProject™	1.0
MacTerminal™	2.0
MacWrite	4.5

Apple Announces New LaserWriter

Last year, Apple launched the era of desktop publishing by introducing the LaserWriter printer. This year, the desktop printing revolution continues with the development of the LaserWriter Plus.

The LaserWriter Plus has 11 built-in fonts.

The LaserWriter Plus features eleven built-in fonts—the four available in the original LaserWriter and seven new ones—contained in an additional half megabyte of ROM. The new fonts are Palatino®, Helvetica® Narrow, ITC Avant Garde Gothic®, ITC Bookman®, New Century Schoolbook, ITC Zapf Chancery®, and ITC Zapf Dingbats®. These, in conjunction with the original LaserWriter fonts—Times®, Helvetica, Courier, and Symbol—offer a total of 35 individual typefaces, for greater flexibility in designing and producing documents.

Current LaserWriter owners can upgrade to the LaserWriter Plus by purchasing the LaserWriter Plus Font Kit (M0191). This kit is dealer installable and contains the new ROMs with the additional fonts, plus a Printer Installation disk (which includes printer drivers for both LaserWriter and ImageWriter printers), LaserWriter Plus Fonts disk (which contains Font/Desk Accessory Mover utility software, and screen fonts for all LaserWriter Plus typefaces), and an owner's manual.

Schools Require/Recommend Macintosh

Many schools are beginning to require or recommend a specific microcomputer for students' use in classes. The following institutions require that students purchase Macintosh:

Drexel University
Mississippi State University Veterinary School
Virginia Polytechnic Institute, Department of Computer Science

In addition, the following schools highly recommend use of the Macintosh:

Dartmouth College
Washington College (Maryland)
Sweetbriar College
Franklin and Marshall College
Colby College
Drake University
Mills College
University of the South
Pacific University

There are some requirements to be happy about!

News and Notes

Technical Word Processing

Include integrals, summations, products, fractions, subscripts, and superscripts in your document.

A graduate student at the University of Rochester, Dennis L. Venable, is marketing a new desk accessory that provides an environment for writing technical equations within Macintosh word-processing programs. MacEqn understands the format of technical equations and provides the user with the ability to include such constructs as integrals, summations, products, fractions, superscripts, and subscripts in documents in the standard picture (PICT) format. It currently supports only the four original LaserWriter fonts, but the results also can be printed on the ImageWriter (though with a decline in quality).

Dennis is providing a liberal site-licensing policy based on the anticipated number of copies to be distributed, as well as a single-user price.

For more information, please contact:
Dennis L. Venable
Software for Recognition Technologies
110 University Park
Rochester, NY 14620

Computers for the Liberal Arts Update

Conference notes are now available.

The Computers for the Liberal Arts Conference, held November 7–9 at Reed College, in Portland, Oregon, was designed to explore the computing concerns of liberal arts institutions. For those who are interested in computer use in the liberal arts but were unable to attend, conference notes are now available.

For further information, contact:
Richard Crandall
Reed College, Physics Department
3203 SE Woodstock Ave.
Portland, OR 97202
(503) 771-1112

Academic Courseware Available

Innovative and useful courseware for Apple computers is constantly under development by colleges and universities. The Academic Courseware Exchange helps institutions to make the most of this valuable academic resource by providing a simple, inexpensive means for distributing software, while paying returns to the institution that developed it.

Your school's software can be distributed for you.

The Academic Courseware Exchange:

• Provides institutions with an effective means for distributing their courseware at low cost while realizing returns on that courseware.

• Provides opportunities to find out about and purchase courseware developed by other institutions for both Macintosh and Apple II computers.

• Kinko's has made a commitment to provide distribution and marketing services for academic developers with courseware written for Apple computers. All you have to do is write or call Kinko's for a copy of its participation guidelines. Then, in accordance with the guidelines and the accompanying participation agreement, you provide Kinko's with the masters of your courseware and documentation, and it handles the rest.

Software will be listed in a catalog that will be available nationwide.

• Kinko's lists your courseware in the *Academic Courseware Exchange* catalog, to be made available to faculty, department heads, and deans at every college and university nationwide. (Kinko's will publish the first *Academic Courseware Exchange* catalog in Spring 1986.)

• Kinko's duplicates your disks and prints your documentation from your masters.

• Kinko's packages your disks and documentation for sale to faculty and students.

• Kinko's processes orders through its 290 Kinko's Copies locations in college towns nationwide, over its toll-free 800 telephone line, or by mail order.

• Kinko's sponsors national promotional campaigns to make educators aware of the availability of courseware from the Academic Courseware Exchange.

For a copy of the participation guidelines and agreement, write to Kinko's, Academic Courseware Exchange, 4141 State Street, Santa Barbara, CA 93110; or call (800) 235-6919 (in California, call (800) 292-6640), and ask for the courseware director.

More Information About Kinko's

Kinko's Graphics, headquartered in Santa Barbara, California, has nearly 300 stores serving the copying and duplicating needs of more than 500 colleges and universities nationwide. For more than 15 years, Kinko's has provided the academic community with a broad range of services, enabling educators to create and distribute educational materials quickly and inexpensively.

Kinko's provides the following services:

• Kinko's "Professor Publishing" service provides faculty with a method for inexpensively and efficiently reproducing and distributing supplementary course materials to their students (such as collections of readings, articles, laboratory assignments, and course notes).

Many services are available in addition to software distribution.

• Kinko's Copyright Permissions Assistance Program is a clearinghouse service for professors and teachers who wish to receive clearance for use of copyrighted material in their courses.

• Kinko's Educational Reprint Service works with major academic journals as an authorized reprint and out-of-print article supplier.

• Kinko's Custom Publishing Service makes professors' specialized course materials available "on demand" to their colleagues nationwide through a catalog.

• Kinko's Copy Creation services, using the Macintosh and LaserWriter, offer near-typeset-quality text at affordable prices.

The Courseware Exchange is another example of Kinko's commitment to providing both conventional and electronic publishing services to the academic community.

SUMMARY OF THE PARTICIPATION GUIDELINES

Who Can Participate?

Courseware submitted to the Academic Courseware Exchange for distribution by Kinko's is developed by faculty, staff, students, and affiliates of colleges and universities. The copyright to the courseware itself may belong to the institution or to an individual associated with the institution. The owner of the copyright retains complete ownership rights to the piece of courseware and is paid a return on sales of that piece of software. This arrangement is nonexclusive and may be terminated on 60-day notice by either party. Details of the arrangement between the developer and the Academic Courseware Exchange are covered in the terms and conditions set forth in the participation agreement, which is filled out by the developer when submitting courseware to the Exchange. Call or write Kinko's for the complete information package.

You own the copyright.

Courseware Submissions. Developers submit their courseware by sending it with the submission fee and a signed participation agreement to the Courseware Exchange office at Kinko's headquarters in Santa Barbara, California. The fees are minimal—$100 for

applications, tools and templates; $25 for a piece of public-domain courseware. Courseware and its documentation are reviewed for conformance with the testing and formatting criteria contained in the participation guidelines. Once approved, the courseware is listed in the catalog and orders can be taken at any Kinko's location nationwide.

Special packaging highlights your involvement in the Courseware Exchange.

Packaging. Packaging for the courseware includes disk labels and a folder that holds disks and documentation. The packaging identifies your courseware as a part of the Academic Courseware Exchange.

Order Processing and Distribution. In order to maintain low inventory costs for the Courseware Exchange, all courseware and documentation are produced on demand, either at Kinko's headquarters in Santa Barbara or at the local Kinko's store. Orders are taken several ways; through Kinko's stores, via toll-free telephone line, or by mail.

Single copy orders. Orders are prepaid by check, cash, or credit card and are then shipped directly to the customer.

Course Adoption. A faculty member may require or recommend student purchases of courseware for a class. The faculty member places the request with Kinko's and then each student buys a copy of the specified courseware from the local Kinko's store. Kinko's student reps work directly with faculty to help them specify the proper titles and quantities for their classes. If there is no local Kinko's store, Kinko's in Santa Barbara will ship directly to a school's bookstore or campus computer center. Kinko's cannot, however, be responsible for prices on products sold this way, due to bookstore markups. All tracking and accounting for orders is done by Kinko's, and payments of returns on sales are made twice a year—in September and March.

You must provide the support for your product.

Courseware Warranty and Replacement. Kinko's assures its customers the highest-quality products and service integrity. If a customer receives a defective or damaged disk, or a manual with missing pages, the Courseware Exchange will replace it.

Courseware Support. All courseware is sold through the Courseware Exchange "as is" so the support of such courseware is *very limited.* Customers may call the Courseware Exchange's toll-free number to report problems. The institution that developed the courseware provides the Courseware Exchange with the name of a person who will respond to error reports or ambiguities in the documentation. Individual customers will not be referred back to the developing institution; inquiries will come from Kinko's.

Courseware Marketing Programs. An Academic Courseware Exchange brochure describes the program's offerings and includes a Business Reply Mail card that can be used to request the *Academic Courseware Exchange* catalog. It's distributed to faculty and staff in colleges and universities via direct mail. Brochures and catalogs are also made available in Kinko's store locations and through on-campus bookstores and computing centers. In addition, advertising in key publications will encourage faculty to call or write for a catalog.

Academic Courseware Definitions. Academic courseware distributed through the Academic Courseware Exchange is generally sold in low volumes relative to commercial products (which are generally targeted at a much broader audience). The Academic Courseware Exchange generally sells courseware at prices that are under $30, in order to make the courseware affordable to students.

Academic courseware is classified in four different categories: public domain, templates, applications, and tools. These classifications are general pricing categories based on the value of the piece of courseware and the investment that the developer has made in developing it.

Public domain programs will sell for about $6 to $8.

Public Domain courseware is cataloged and distributed through the Exchange at minimal cost with no return paid to the developer. This type of courseware varies greatly; it may have been developed on a government grant, so that the developing institution feels no obligation or has no right to collect returns, or it may be a program that has no clear owner or developer. Generally, people will be willing to pay about $6 to $8 for this type of courseware.

Templates, artwork, etc. will generally be sold at $8 to $12.

Templates are add-ons or files for use with commercial productivity tools. Examples of these include MacPaint artwork for use in biology laboratories, or Multiplan spreadsheets used in accounting courses. Also included in the template designation are applications written in uncompiled BASIC or Pascal, which require that the student purchase the BASIC or Pascal interpreter/compiler. Generally, people will be willing to pay about $8 to $12 for this type of courseware.

Actual applications would cost about $15.

Applications are self-running, interactive programs designed to analyze, inform, and/or provide opportunities for exploration within a particular discipline. An example would be a statistics processor for a social sciences course. Generally, people will be willing to pay about $12 to $18 for this type of courseware.

Tools or utilities could range from $18 to $27.

Tools are multipurpose programs designed to create new applications within a discipline—for example, authoring languages, programming languages, and debugging tools. Generally, people will be willing to pay about $18 to $27 for this type of courseware.

Courseware Developer Assistance

Apple developer's packets are available.

Courseware developers who plan to use programming languages that produce compiled source code should obtain an Apple Developer's packet from Apple Developer Relations, 20525 Mariani Avenue, Cupertino, CA 95014; (408) 973-4897.

The information in this packet is *essential* to anyone developing software of any type. It includes information on technical documentation, development languages, and utilities. It also includes a description of Apple's Certified Developer Program and an application to become a Certified Developer. Certified Developers are eligible for special pricing on equipment needed for developing software, and they receive mailings of technical information, product announcements, and other important information. The Certified

Developer Program is Apple's means of keeping the development community informed of its directions and plans.

Courseware Testing Guidelines
Courseware submitted to the Academic Courseware Exchange must be thoroughly tested according to the testing criteria given in the participation guidelines. Generally, these testing requirements include:

- Testing on campus in coursework for at least one term.

- Structured software testing, in which all features of the software and documentation are tested for functionality, accuracy, and error-handling.

Documentation Format and Editing Suggestions
Writing good documentation is important to the usefulness of your product. Documentation need not be long and arduous—just sufficient to help the user do what is intended with your product.

Good documentation is essential.

The participation guidelines include many helpful suggestions on how to write and structure your documentation so that it is easy to read and use.

Support Policy
Courseware sold through the Courseware Exchange is *essentially unsupported* to keep its cost low. However, the developer must agree to respond to reports of serious bugs and must be willing fix those bugs within 90 days of the first report of a fatal crash. All submissions to the courseware exchange must be acompanied by the name of someone who will respond to reports of bugs or errors in the documentation. This name will not be released to users of the courseware. Kinko's will take calls from users on its 800 number and route the questions or problems to the support contact.

All developers involved with the Academic Courseware Exchange must agree to do the following:

- Respond to problem reports within at least two weeks.

- Fix "fatal errors" within 90 days of first report.

- Work in good faith to solve all errors and problems.

Copy Protection Policy

In order to minimize production costs, software distributed through the exchange must not be copy protected. Prices are kept low so that people are not encouraged to copy. A copyright and disclaimer notice, included with each courseware product, advises the users that it is illegal to copy the software.

Copy protection not allowed.

Center for Music and Technology

The Center for Music and Technology is part of the Department of Music at Case Western Reserve University, in Cleveland, Ohio. It provides a facility to enhance music instruction and study for faculty and students of both Case Western and the Cleveland Institute of Music. Working in conjunction with the school's electronic music studio, the center is dedicated to providing:

Music and technology come together.

- The latest advances in computer-aided instruction in music for the following topic areas:
  - —music theory (ear training, sight singing, keyboard skills)
  - —music history (general appreciation, historical style, performance practices)
  - —music education (music learning and teaching styles, creative thinking)
- A music printing facility for desktop production of full scores, parts, and texts
- Support for music and technology activities, such as courses in software development in music and research on computer systems and video and audio peripherals
- A place to acquire entrance-level skills in digital sound synthesis and music sequencing

The center, which opened in January, is funded by grants from the Cleveland and Kulas Foundations. It encourages synergy between music students and faculty and those in the university's engineering and science programs. Many cooperative research projects are in progress or are being planned. The center also is dedicated to serving the area's musical community by offering workshops for primary and secondary school music teachers and area high school students.

A full range of Apple IIe programs for music theory and music education are supported by the center, including the complete line of collegiate-level software from Temporal Acuity Products. A network of Macintosh systems provides the basis for sharing music composition and printing software, which includes Professional Composer, Performer, Deluxe Music Construction Set, MusicWorks, and other low- and high-end packages. A selection of nonmusic software is also supported for faculty and student use, including a range of word processors, file managers, graphics routines, and programming languages.

Equipment at Haydn Hall includes:

Macintosh, MIDI, LaserWriter, synthesizers, and much, much more !

- 8 Apple IIe computers equippped with digital-to-analog sound cards and MIDI interfaces
- 3 Macintosh 512K computers with external 800K drives and MIDI interfaces
- 1 Macintosh Plus with external hard-disk drive
- 1 LaserWriter printer
- 2 ImageWriter II printers
- 1 AppleTalk networking system for all Macintosh computers and printers, using MacServe as file server

- 1 IBM AT computer
- 3 Korg DW-8000 Programmable Digital Waveform synthesizers
- 1 Boss BX800 Mixer
- Temporal Acuity Products' Pitch Master and Tap Master
- 1 Apple Personal Modem

In addition, the center supports an Apple IIe and a Macintosh 512K at the Cleveland Institute of Music.

For additional information contact:
Dr. Peter Webster
Chairman, Department of Music
Haydn Hall
Cleveland, OH 44106
(216) 368-2400

Third-Party Products Take Advantage of Macintosh Plus Features

The new Macintosh Plus computer and LaserWriter Plus printer increase the speed, power, and flexibility of the more than 1,000 third-party software and hardware products with which they work.

The Small Computer Systems Interface (SCSI) port on the new computer's back panel lets third-party hardware manufacturers connect high-speed storage systems, such as hard disks and tape backups. The SCSI port, which uses an industry-standard parallel interface, represents Apple's first step in opening the computer's architecture to make it easier for third parties to connect their products to the Macintosh. Up to seven SCSI peripheral devices can be connected in a daisy-chain configuration to this port, giving users greater expandability. And the data transfer rate is up to five times faster than that of the computer's external disk-drive port.

The SCSI port will provide the impetus for a wide variety of new Macintosh peripherals.

"The increased power and capabilities of the Macintosh Plus demonstrate Apple's continuing efforts to provide developers with the hardware they need to create the best software possible," said Guy Kawasaki, manager of Apple's software product management group. "At the same time, our engineers have worked very closely with the software development community to ensure that as we enhance the Macintosh, we retain backward compatibility with the more than 1,000 software packages now available for the Macintosh. We believe it is critical that we protect the investment our developers have made in Apple."

Several major hardware developers and software publishers, including Lotus Development Corporation and Aldus Corporation, have revised their programs to take even better advantage of Apple's new products. The following is a list of some of these enhanced third-party software and hardware products. The listing includes existing products, software packages that have been revised for the Macintosh Plus, and new hardware products that run off the SCSI port.

Adobe Systems Inc.

TYPEMASTERS—Adobe Systems, developer of the PostScript controller language, which drives the LaserWriter printer, has announced new downloadable typefaces for the LaserWriter. These fonts include typefaces from two famous type libraries: Mergenthaler and International Typeface Corporation.

Aldus Corporation

PageMaker 1.2—PageMaker 1.2 takes advantage of Apple's enhancements to the Macintosh and LaserWriter. It allows full access to the seven new font families in the LaserWriter Plus, and it supports the ability to download the 12 new fonts available from Adobe Corporation for use with the LaserWriter or LaserWriter Plus.

AST Research, Inc.

AST-4000—This 74-megabyte hard disk/60-megabyte streaming tape backup subsystem is designed to plug into the Macintosh Plus computer's SCSI port. Based on AST's Colossus product line, originally developed for the IBM PC family, the AST-4000 can be expanded to 370 megabytes with optional expansion units.

Blyth Software Inc.

...multi-user data-base systems...

Omnis 3—This multiuser data base for Macintosh features a built-in, mouse-driven programming language that allows users to create a variety of applications in a fraction of the time taken by traditional programming.

Boston Software Publishers, Inc.

MacPublisher II—This desktop publishing package contains manual and automatic kerning, depth justification, a graphics palette with 99 patterns, automatic page jumps, and a 96-page capacity.

Mac-Hy-phen—This automatic, dictionary-based hyphenation package is ideal for use with MacPublisher II, Microsoft Word, Aldus PageMaker and other programs that support discretionary hyphenation.

Dayna Communications, Inc.

...IBM processing...

MacCharlie Plus—This enhanced version of the MacCharlie workstation lets Macintosh users run IBM software and connect to IBM mainframes and networks. It includes a single disk drive, 256K RAM, 10 function keys (through an extended keyboard), Apple's Switcher, MS-DOS 3.1, and GW-BASIC.

Digital, Etc.

Turbo Maccountant—This new product, which capitalizes on the new Macintosh Plus features, such as the built-in numeric keypad and

the increased floppy-disk storage capacity, combines general ledger, accounts receivable, accounts payable, payroll, and invoicing in one program.

Dow Jones Information Systems

...3D modeling...

Straight Talk—Straight Talk is an information software program that offers the user access to Dow Jones News/Retrieval and other electronic information services. Key features include auto log on, pull-down menus for News/Retrieval data bases, and on-line and off-line printing and access to cut, copy, and paste functions.

Enabling Technologies, Inc.

Easy3D—Distributed by Ashton Tate, this modeling program enables users with no previous computer graphics experience to quickly create realistic, shaded solid objects. Using the mouse, objects or entire scenes can be created, rotated, lit, distorted, moved, and joined.

General Computer Corporation

HyperDrive and HyperDrive 20—The HyperDrive products are internal hard-disk drives for the Macintosh, and are fully compatible with Apple's new Macintosh Plus.

HyperDrive 2000—This new internal hard-disk drive/coprocessor board for the Macintosh and Macintosh Plus increases the computer's RAM to 2 megabytes. It includes a 20-megabyte hard-disk drive, a 12-megahertz 68000 microprocessor that doubles the processing speed of Macintosh, and a 68881 floating-point processor that improves the speed of numerical processing on the Macintosh.

HyperNet—Based on a system of distributed file storage, HyperNet gives AppleTalk network participants access to files, programs, and hard disks located anywhere on the network.

Great Plains Software

...bookkeeping and accounting...

Plains & Simple—This software package emulates the widely used manual "one-write" bookkeeping and accounting system. The product automates the general ledger, accounts receivable, and accounts payable functions, and provides summary and detailed balance sheets plus income statements. It also features trial balance, summary and detailed aging reports, checks, customer statements, customer and vendor lists, mailing labels, and telephone cards.

Hayes Microcomputer Products

InterBridge—This local and remote bridge connects several AppleTalk networks, allowing access from one network into another for more efficent use of Macintosh computers, LaserWriter and other printers, file servers, and modems.

...resource sharing...

Infosphere

MacServe—This network disk and printer software product lets users share hard disks and printers for the Macintosh over the AppleTalk network. It takes advantage of hard disks and tape backup devices that use the SCSI interface to create high-performance servers. In addition, it supports Apple's Hard Disk 20.

...hard disks and network servers...

IOMEGA Corporation

Bernoulli Box subsystems and 20Mb Network Server–IOMEGA's Bernoulli Box subsystems combine the performance and capacity features of Winchester fixed disks with the media-removability benefits of traditional floppy disks, giving users economical data storage units that are immune to head crashes and problems caused by vibration and contamination. Storage capacities range from 5 to 40 megabytes. IOMEGA also has announced a 10+ 10 removable hard-disk system that uses the SCSI interface.

Layered Inc.

Insight—This accounting series for the Macintosh and Macintosh Plus includes three comprehensive, integrated accounting modules: accounts receivable with billing, accounts payable, and general ledger. The program goes beyond simply reporting numbers by interpreting and explaining them through its "Expert Reports" function, which uses artificial-intelligence principles and industry-specific data to recommend appropriate courses of action based on the figures.

Levco

MacSuper 20, MacSuper 20 FP—Levco's new clip-on performance enhancers for the Macintosh product line include a Motorola 68020 processor; one, two, or four megabytes of RAM; and a socket for a Motorola 68881 floating-point coprocessor. The MacSuper 20 FP includes the floating-point coprocessor.

...enhanced spreadsheets...

Lotus Development Corporation

Jazz, Release 1.A— This enhanced version of Jazz, the five-function integrated business software from Lotus, has been designed specifically to take advantage of the new Macintosh Plus.

Manhattan Graphics

ReadySetGo 2.1—This desktop publishing program features a RAM-resident design that can handle up to 40 pages. It offers a built-in production editor and advanced picture capabilities.

MDIdeas

HD-20 and HD-30—These 20- and 30-megabyte external hard-disk drives for the Macintosh Plus take advantage of the SCSI expansion port. HD-20 can store as much data as can be stored on

twenty-five 800K disks and HD-30 can store as much data as can be stored on thirty-seven 800K disks.

MICAH, Inc.

MicahDrive 10 AT and 20 AT—These internal hard disks for the Macintosh and Macintosh Plus feature an internal SCSI interface, leaving the Macintosh Plus external SCSI port free for other devices. The 10- and 20-megabyte drives are user-installable.

Microsoft Corporation

Excel—Excel takes advantage of the new features of the Macintosh Plus to offer power spreadsheet users even better performance. The Macintosh Plus allows Excel users to build worksheets as large as 750 kilobytes.

Odesta Corporation

Helix—Odesta's four Helix products—Helix, Double Helix, RunTime Helix and MultiUser Helix—take advantage of the speed and memory enhancements of the Macintosh Plus. Both individual and multiuser Helix applications will run up to three times faster on the Macintosh Plus, and the SCSI port allows Helix users to work with new peripherals, including faster and larger-capacity hard-disk drives.

...three times faster access to data...

Paladin Software Corporation

SuperCrunch—This spreadsheet product for the Macintosh includes graphics, data management and note-keeping capabilities on a single disk. Closely tailored to the Macintosh environment, SuperCrunch incorporates a unique icon bar that turns 21 common spreadsheet functions into simple point-and-click symbols. It also offers power features such as macros, three-dimensional worksheets, design-your-own icons, and voice output.

Singular Software Inc.

Interlace—This software product merges the power and capacity of a relational data base, the calculation capability of a spreadsheet and the ease of use of a visual layout system into a single application.

SpectraFax Corporation

SpectraFax—This flatbed scanner for the Macintosh and Macintosh Plus accepts color or black and white images and prints them in color or black and white on an ImageWriter II printer. Optional optical character recognition (OCR) and facsimile boards allow the scanner to input text and to communicate via voice-grade telephone lines with standard facsimile machines.

...scanning devices...

Sunol Systems

Sun*Streak—Sunol Systems offers this high-capacity, high-speed, on-line Winchester disk system compatible with Macintosh and Macintosh Plus computers. The disk system includes 10 to 110 megabytes of storage, optional tape backup up to 60 megabytes, and connections via either AppleTalk or the SCSI port.

SuperMac Technology

DataFrame 20—Specifically designed for the Macintosh Plus, this 20Mb SCSI hard disk runs under the hierarchical filing system.

Think Technologies, Inc.

...electronic mail...

InBox—This desktop communications application for Macintosh computers lets AppleTalk network users send electronic mail and memos, and offers users true file sharing capabilities.

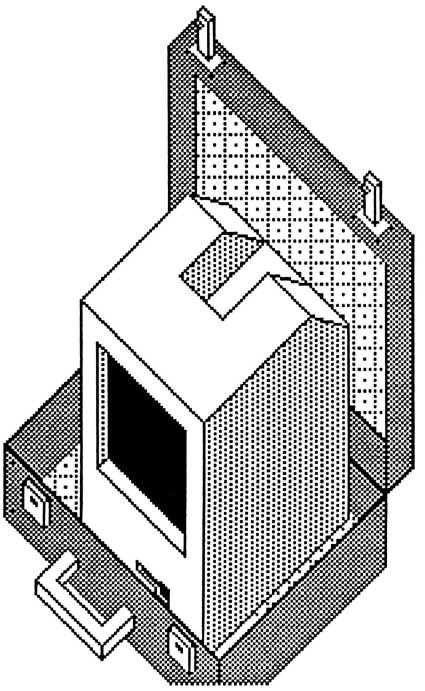
Univation, Inc.

...more storage devices.

Slimline Hard-Disk Subsystem—Specially designed to take advantage of the new SCSI expansion port, the Slimline subsystem offers 20- or 30-megabyte hard-disk drives mounted vertically above a 10Mb removable cartridge hard-disk drive.

3Com Corporation

DiskPlus—DiskPlus is an expansion disk for the Macintosh Plus that allows 3Com's 3Server Expansion Disk to be attached to the SCSI port. It offers 70 megabytes of storage capacity and a 30 millisecond average access time.



Faculty Author Development

The University of California at Santa Barbara has recently instituted a Faculty Author Development Program to promote the development of courseware. John E. Doner, of the Department of Mathematics, is the coordinator. He also serves as a consultant for faculty working on courseware projects under this program. About a dozen projects are currently under way. Some of these may eventually be reported in *Wheels for the Mind* as completed projects. Most of the projects are aimed at the Macintosh. This machine seems to start the creative juices flowing in a lot of people.

More* Wheels *projects on the way.

Computer Writing Resource Kit

The Computer Writing Resource Kit provides teachers and students with guidelines and suggestions for using word processing to enhance the writer's potential for fluency, effectiveness, and creativity in writing. The kit consists of four parts: a faculty handbook, a student handbook, a writing activities disk, and a writing activities script.

The faculty handbook contains resource information for instructors who wish to incorporate computers into writing instruction. Various special topics and instructional activities provide the teacher with resources needed to positively affect the quality and quantity of time students spend using the computer at each stage of the composing process. The faculty handbook also contains an introduction to the use of computer-aided instruction in writing, examples of various uses, software evaluations, and a bibliography of articles, books, software, and other resources.

A faculty handbook provides activities and assistance.

The student handbook and the writing activities disk (available for both the Apple II and the Macintosh) contain advice and hints on using word-processing features to improve writing skills, and computer activities in which students practice the techniques learned. Together, these two components teach students to use the word processing effectively in the prewriting, writing, and rewriting stages of the composing process, and introduce students to such publication considerations as cover design, layout, font selection, and graphics—which have taken on new significance in the computer age of "text as image."

The fourth component of the kit is a writing activities script, which offers teachers help in planning lessons.

To order in the U.S., call toll free at 800-428-8071 (in Massachusetts, call (617) 862-6650).

In the U.K. and Europe, contact Mr. Donald Reinders, Castle House Publications, 27 London Road, Tunbridge Wells, Kent, England TN 1BX; or call (0892) 39606.

In Australia and New Zealand, contact Mr. Adam McComb, Book and Film Services, P.O. Box 226, Artarmon NSW 2064, Australia; or call 439-6155.

Computer Resource Kit was prepared by Stephen Marcus, Ph.D. at the University of California, Santa Barbara and DC Heath, 125 Spring Street, Lexington, MA 02173.

Software: Registrar's Office

Have your Macintosh be the registrar.

Registrar's Office is an academic administration data-base management package designed for small to medium-sized colleges (fewer than 5,000 students), departments, or graduate schools with their own administrations. It is intended for use as an MIS system, and offers true mainframe DBMS capability on a Macintosh 512K computer.

A powerful, fast data-base management system with excellent vendor support, Registrar's Office faithfully follows the Macintosh user interface, which makes it very sophisticated, yet easy to use.

The program is being used by the Wright Institute in California (a psychology graduate school at which the developer was a doctoral student before developing this package), as well as being evaluated by numerous other independent graduate schools.

Registrar's Office is a data-base management solution for all the information-tracking functions of a college, graduate school, or department, including:

- scheduling classes
- enrolling students
- recording attendance
- entering grades
- maintaining all student academic records (transcripts, reports, and so forth)
- recording demographic information
- tracking faculty and course records
- printing mailing labels
- providing reports to students, faculty, staff, and government agencies

It is fast and efficient, with easy-to-use Macintosh menu items and on-screen controls, and can provide more than 50 reports, ranging from class lists, transcripts, and student schedules to government reports.

Customized reports are also available, and the developer will customize the system for the institution as part of the turnkey system fee.

If you wish, a complete turnkey system can be provided.

A complete turnkey system, including customized data fields and reports, user documentation, consulting, and training, is available for $10,000. Registrar's Office requires a Macintosh 512K or Macintosh Plus with a 10- or 20-megabyte hard disk. It accepts DIF, SYLK,

Microsoft, Lotus, and other file formats. The program works with either the single-user or multiuser version of Omnis 3, is licensed for network use, and offers full multiuser capability.

For more information contact:
Robert Gross
Right Track* Software
39455 Albany Common #N
Fremont, CA 94538
(415) 797-1160

Software Package: Notepro

Notepro is a set of tutorials designed to help college students learn more effectively by reviewing their notes more efficiently. It is designed to be used by individuals daily and contains information about different learning techniques that can be used to review notes taken in class, in the lab, from books—or anywhere.

Where would the college student be without class notes?

A good example of student productivity software, Notepro faithfully follows the Macintosh user interface. Use of graphics is limited, though the developer says that the next version will support MacPaint graphics.

The software would be most useful in subject areas that have a large taxonomy, or a variety of theories/philosophies to compare and contrast (for example, Freudian vs. Jungian theory). Particular areas of application include the physical sciences (such as biology, geology, and agronomy), social sciences, and foreign languages.

This method of note synthesis has been used at the University of California Medical School at Irvine for five years. One of the authors has taught it as a learning skills course for medical students and based the development of the software on the content of the course.

Notepro has five different, sequentially linked study processes:

1. CLASSNOTES—The process in which you begin to restructure and review the notes taken in class by entering them into Notepro.

Now you can review, summarize, and work with your notes more efficiently.

2. PRONOTES—This process further restructures your notes by formatting them into an outline.

3. SPEEDREVIEW—This operation allows you to review files created with CLASSNOTES and PRONOTES quickly.

4. SPEEDCHARTS—This process helps you create a chart to easily compare and contrast main ideas from your notes, using a matrix for making comparisons and contrasts.

5. TEST SIMULATOR—This process tests your knowledge and retention of SPEEDCHARTS.

Though using Notepro requires time, effort, and discipline, it will inevitably increase a student's ability to understand and retain course material.

Notepro runs on any Macintosh and will accept MacWrite files that have been saved as "text only." It can also be used with on-line database services that can download text files, such as Paperchase and Lexis. The Notepro package consists of a disk and a 24-page instruction manual. Its suggested price is $59.95; Reseller or volume pricing varies up to 50 percent off for quantities greater than 25. The company has a liberal update policy, and demo disks are available.

For more information, contact:
Learning Skills Corporation
P.O. Box 8038
Reno, NV 89507
(707) 825-9537

Statistical Analysis Package

More powerful than the original StatView.

BrainPower, Inc. has announced StatView 512+, a statistical analysis package for the Macintosh 512K. The new package offers more analyses, data-handling features, and graphic analysis presentations than does StatView, BrainPower's current statistics package. StatView 512+ doesn't replace StatView, it complements it by expanding BrainPower's offerings to Macintosh users working with statistics.

StatView 512+ contains all analyses found in the original StatView plus the following statistics not included in the earlier program: multivariate analysis techniques for exploratory factor analysis with orthogonal and oblique transformations; stepwise regression; one-through four-way ANOVAs with repeated measures and unequal cell frequencies; confidence intervals, standardized beta coefficients, adjusted r-squared, and Durbin-Watson for all simple, multiple, and polynomial regressions; 8-row by 8-column contingency (frequency) table analysis; user-specified confidence intervals (t and normal distributions); frequency distributions with unlimited, user-specified intervals; and confidence intervals for simple regressions.

StatView 512+ also offers the following data-handling features not found in original StatView: set columns that allow users to code, sort, and group alphanumeric data; string columns to allow users to document data sets; composite graphics to let users compare results of analyses or plots of multiple data column values on the same axis; interactive graphs to let users adjust features of graphic views; graphic view windows expandable to full screen size; additional views ; the ability to run concurrent analyses on multiple pairs of data columns; quick assignment of variables; and the ability to cancel analyses in progress.

StatView 512+ will ship in May 1986 with a suggested list price of $349.95.

Keyboard Extension Cable

Stand back and admire your Macintosh.

Cable Tech has developed a 12-foot extension cable for your Macintosh keyboard. The cable works with all Macintosh computers except the Macintosh XL. It also works with the numeric keypad and Numeric Turbo. Price is currently $9.95.

For information, contact:
Cable Tech
2261 Market Street
San Francisco, CA 94114

New Magazine

Want a single source that provides an overview of Macintosh-related literature?

MacBriefs is a magazine dedicated to giving its readers an overview of all Macintosh-related literature. It organizes information in a way that facilitates easy reference. Subscriptions are $12 per year.

For information contact:
MacBriefs
P.O. Box 2178
Huntington Beach, CA 92647
(714) 842-0518

MacEMPIRE

MacEMPIRE stands for Experimental Mathematical Programming software for Instruction and REsearch on the Apple Macintosh microcomputer. It is not a commercial package. Instead, an open-box, open-ended approach is used to disseminate codes, designs, tutorials, test problems, visual aids, and more on an evolving basis.

Among its goals are the following:

A new aid for teachers of mathematical programming.

- To explore and exploit the Macintosh environment (as well as its future generations of relatives) in the study and design of optimization and decision support systems.
- To provide teachers of mathematical programming, operations research, management science, management information, and decision support systems with both basic and sophisticated tools to implement courseware of their own design.
- To facilitate algorithmic and methodological research, especially at the graduate dissertation level, by easy access to commercial-grade software that can be readily modified and extended.

MacEMPIRE covers every practical topic of optimization and decision support. Both well-tested, rigorous methods and untried but promising heuristics will be included. Equal emphasis will be put on the modeling aspects of mathematical programming. Codes and tutorials scheduled for release in Vol. 1 (1985–86) include linear, network, assignment, dynamic, multiobjective programming, an extremely easy-to-use modeling system called "coMPoser," and numerous test problems. This will be followed by integer, nonlinear, and global optimization. Once a significant software base has been developed, continuing effort will focus on upgrades and extensions prompted by new developments in theory, practice, and hardware.

Software will fall into three primary designations:

1. C (Courseware): for illustration and designed to accommodate textbook type problems.

2. B (Building Block): incorporating advanced concepts while maintaining accessibility.

MacEMPIRE will be available quarterly.

3. A (Application): stand-alone programs for routine applications.

Conditions of Use and Subscription Policies

MacEMPIRE will be issued quarterly on a 3 1/2-inch, 400K disk. Although many programs can be dimensioned to run on Macintosh 128K, the default configuration assumed is a Macintosh 512K with an external disk drive and Macintosh Pascal. Most courseware and building block programs will be Pascal, but application programs may be written in any language.

Individuals or institutions can subscribe.

Two forms of subscription are offered: Individual subscription is intended for personal coursework or research on a single machine; and unit subscriptions are offered to academic, research, or corporate units. Faculty, staff, employees, and students in subscribing units are entitled to copy and use MacEMPIRE for the purpose of coursework, research projects, or in-house applications. To illustrate, a professor may subscribe individually and use MacEMPIRE to design courseware; however, his department must be a unit subscriber before such courseware is put in to actual use. Unauthorized use is prohibited by copyright laws.

Users are encouraged to modify or enhance any program to suit their particular needs. Apart from detailed documentation, tutorials, and hints and suggestions, a forum will be provided for inquiries and information exchange. However, MacEMPIRE is not a commercial product and will not be supported as such. The publisher assumes no responsibility for any consequence of its use in any form.

Subscription rates (Effective February 1986) for four issues per year are as follows:

Individual Subscription:	U.S. and Canada	$60
	Elsewhere	$70
Unit Subscription:	U.S. and Canada	$600
	Elsewhere	$700

A preview copy of Volume 1, No. 1 is available for $10. (All prices are given in U.S. dollars.)

For information, contact the publisher:
Professor J.K. Ho
614 SMC-UTK
Knoxville, TN 37996-0562

Fonts for Professional Linguists

Megatherium Enterprises has released Mac the Linguist 2, a set of new Macintosh fonts designed for linguists and other language specialists. The font package retails for $70. The new fonts provide 217 printing symbols, including 129 not found in any of the standard Macintosh fonts.

The new fonts provide 217 printing symbols.

The two fonts, "LinguistG" and "LinguistNY," are modeled on the Geneva and New York fonts and can coreside with them, so symbols from standard and Mac the Linguist 2 fonts can be used in the same documents. Each font is provided in at least six sizes: 9, 10, 12, 18, 20, and 24 points. LinguistG also comes in a 14-point version. Both fonts include the most frequently used symbols from the international phonetic alphabet, a writing system developed for the use of linguistics professionals. Other symbols in common linguistics use are also included.

The new fonts include all the letters and symbols (upper and lower case) needed to write a number of languages that cannot be written with the standard Macintosh fonts. These include Albanian, Basque, Czech, Estonian, Hungarian, Icelandic, Latin, Latvian, Navajo, Old English, Polish, Romanian, Serbo-Croatian, Slovak, Turkish, Vietnamese, and other languages.

Included are symbols for Albanian, Basque, Czech, Estonian, Hungarian, Icelandic, Latin, Latvian, Navajo, Old English, Polish, Romanian, Serbo-Croatian, Slovak, Turkish, and Vietnamese.

The Mac the Linguist 2 fonts include 26 distinct types of accent marks, or diacritics. Variations of these are provided for use with characters of different widths and heights. Unlike the accent marks in the standard Macintosh fonts, these are true "dead keys," which can be combined with any character in the font. Since two or more diacritics can be added to the same character, thousands of symbols can be produced in a single font.

For further information, contact:
Allen Munro
Megatherium Enterprises
P.O. Box 7000-417
Redondo Beach, CA 90277
(213) 545-5913

Coming Attractions
Summer Wheels Feature Section

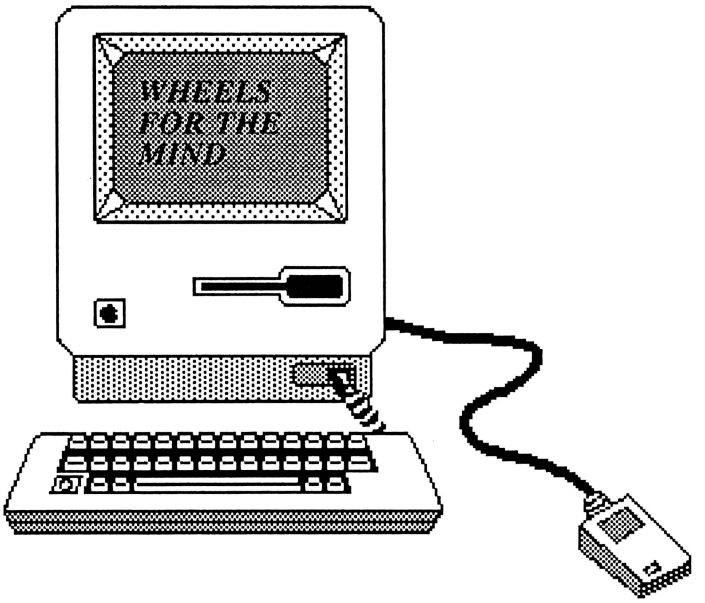
Stay tuned! Desktop communications to be featured.

As the number of available information sources increases exponentially, so does the need for us to be able to have access to, manage, and apply this wealth of information. The personal computer has the potential to meet this need—to allow us to handle the growing sea of information increasingly efficiently. Such computer use is referred to as "desktop communications."

The summer issue of *Wheels for the Mind* will feature a special section that describes the concept of desktop communications in more depth and details specific solutions that are available. In addition, a number of projects are being developed at institutions of higher education around the country, and we will bring several of them into focus for you.

Desktop communications will enable us to handle information (text *and* graphics)—navigate through it, integrate it, manipulate it, enhance it, share it, and communicate it—in ways never before possible. And Macintosh lets all this take place in an easy-to-use, transparent way, while allowing integration of information across applications and environments.

Be sure to look for the Desktop Communications Feature Section in the summer issue of *Wheels for the Mind.*



News from the Networks

Compiled by: Jerry Keough
Department of Mathematics
Boston College
Chestnut Hill, MA 02167
BITNET: KEOUGH@BCVAX3
APPLELINK: A02

Once again, I've been snooping around on the networks.

Much of what goes by on the wires is requests for information and help, and answers often appear within a day or two. For many of you who are isolated from other Macintosh users, the networks (whether they're commercial services or those available through educational institutions) provide a way to communicate what you've found out about using the Macintosh, as well as to get some very "professional" help in solving your problems.

One area of network traffic I usually don't include in this column is product reviews. The Products section of *Wheels* provides some of this information. But if you're thinking about buying a software or hardware product, chances are that you'll be able to find several comments (many with great detail) out on the nets from a variety of users with different hardware configurations. These can be helpful in deciding whether the product is appropriate for you.

Please send me some electronic mail with your comments, suggestions, and news for other Macintosh users.

The notes that follow are from the Info-Mac Digests, moderated at Stanford by Bill Berner (address: INFO-MAC-REQUEST@SUMEX-AIM.ARPA). I'd like not to slight the other nets, but "getting from here to there" is sometimes difficult from where I am. If some of you out there want to send material from other nets, I'll be happy to put some of it into future issues.

As usual, I encourage your electronic comments and criticisms. I very much enjoy logging onto our VAX mainframes and getting the welcome greeting: "You have 7 new Mail messages."

(Editor's note: The following entry is in response to a question expressing concern with whether existing software will run properly on the new Macintosh Plus.)

From: CML5A9%IRISHMVS.BITNET@WISCVM.WISC.EDU
Subject: Re: Deep ROM
I have yet to have any problems with compatibility with the new ROMs. There *is* an alternate screen buffer in the Macintosh Plus; in

Most programs seem to work quite well on the new Macintosh Plus.

fact, aside from the SCSI port and the meg of memory and the ROMs and new drives, the machine is the same. I have yet to find many programs that don't work well with it, and most of those that have troubles are due to an incompatibility with HFS and not the ROMs. In addition, there is a patch program out there that modifies the HFS so that many programs will search down directory paths automatically. It's not perfect, but it helps sometimes. I would be very surprised to hear that major software products do not work with the Macintosh Plus.

And as for games, all of the ones I've tried work just fine. Many games out there *do* bypass QuickDraw, but they do it by writing directly to screen memory that's pointed to by set locations. This is the way to do it, rather than hard coding some screen address. You can get very acceptable speed out of a game just using bit-copy operations into the BitMap in this way without having to resort to the alternate screen buffer. However, if any of these games *do* use the alternate screen buffer, they will still work fine on a Macintosh Plus.

My software booted and ran the first time I tried it, but then again I'm not doing any of the "no-no's" that Apple warned us about. I would say that, in general,the Macintosh Plus is a hell of a lot more compatible with the Macintosh than an XL running MacWorks™ software. But then again, why shouldn't it be—after all, it's basically the *same* machine.

Tom Dowdy —"If it jams, force it. If it breaks, it needed fixing anyway."

From: Gustavo Fernandez <FERNANDEZ@SU-SUSHI.ARPA>
Subject: Software Piracy and Perceived Value

How do you feel about pirated software?

Ask five people why there is so much piracy throughout the software industry, and get five different answers. I will, however, elaborate on a reason that I believe has not been given much thought. It has to do with product value. All legal and moral judgments aside, does a pirated software product (whether computer, video, audio, or other) have the same, more, or less value than the original? The answer, amazingly, is very dependent on the individual case.

Things that add value to pirated software:

- Removal of copy-protection.
- Providing several programs on the same media.
- Mix of programs (most applicable to audiocassettes).
- Documentation provided on the media.
- Availability of documentation from third parties.
- Availability on alternate media.

Things that decrease the value of pirated software:

- No original documentation (unless someone did a *very* good job of photocopying).

- Lower-quality recording (mostly for analog recordings).
- Unavailability of service and support.
- No pretty packaging.

These principles seem obvious to me, but it's amazing how few software companies take them to heart. It is obvious that copying creates little or no decrease in value of a product such as an arcade game, which requires little documentation, if any. Generally, the pirated version will have the copy protection removed and may even contain several similar programs on one disk. In this case, the value of the pirated version is much *higher* than that of the original.

Documentation is a very valuable commodity.

On the other end of the spectrum, there are programs such as Jazz, which have voluminous manuals that are hard to copy, but for which ready replacements are available at your local bookstore. It seems as if everyone is out to one-up the software publisher by writing a manual that goes into every bit of detail about the product and includes even more hints and practical examples than the original manual. Ironically, the software publishers are openly supporting these "fourth-party" booksellers—and in at least one case (Microsoft), selling these books themselves.

This is not a new phenomenon, however. Small software publishers were selling "manual only" versions of their products at greatly reduced cost ever since the early CP/M-based business and development products became available in the late '70s and early '80s. This was when almost all sales were via mail order, and many users were reluctant to lay out large sums of money before they knew what they were getting.

The marketplace has changed greatly since then. Book publishers have found that selling computer-related books is big business, and everyone is out for a piece of the pie. While software publishers grumble about users stealing their software and violating their software licenses, there are relatively few cases of them suing book publishers for disseminating proprietary information.

Have you ever made a cassette with all of your favorite songs on it?

The audio industry has had to deal with a similar problem—with a slightly different twist. In this case, many people, especially teenagers, simply cannot afford to buy all of the records and prerecorded tapes that they want. Instead, they simply copy friends' records onto blank cassette tapes, which are much cheaper. Cassettes even provide the greater flexibility of being able to put different songs by different artists on one tape, thus creating a "mix" tape that might contain much more interesting material than a lot of the less popular songs on the original albums. In this case, the value of the illegally copied cassette is much higher than even that of the combined albums from which it was created, because all of the popular songs are already put together.

Double-cavity cassette decks (which facilitate copying) are gaining in popularity. This is an example of a situation in which the interests of the hardware manufacturers are blatantly opposed to those of the software sellers. Much the same might be said of the situation in the computer industry. Several companies—especially Apple with its Apple II—products' existence relies on the sheer volume of software

available for the machine. If we take the software vendor's claims of lost sales to be true, much of this is due to piracy.

The audio industry, however, has found a very interesting and positive solution to this problem: the compact disk. CDs are small and almost as portable as cassettes, the audio quality is much higher, but they are virtually uncopyable. This is not because they are protected in any way, but because any copy of a CD will almost certainly lack the quality of the original. The public has come to appreciate high-quality audio; home audiophiles are constantly upgrading their systems.

The public in general, however, has not come to appreciate high-quality video, as seen by the relative unpopularity of videodiscs. Instead, the public has traded quality for recordability, and snapped up VCRs as fast as Japan can make them. The video industry has thus seen the rejection of one technology by the public in favor of a clearly inferior one that allows copying, and indirectly, piracy.

Some manuals are absolutely necessary in order to be able to use the product effectively.

The methods that have been used by software vendors to improve the value of the original product, and hence degrade that of pirated counterparts, are amazingly few in number. Borland International is too often cited by users as the model that other vendors should follow. It provides extremely high-quality software, uncopy-protected, at reasonable prices. Less often mentioned is the *real* copy protection in products such as Turbo Pascal—the manual. This is a thick paperback that's relatively hard to photocopy, but absolutely necessary for the effective use of the program.

Providing some "extras" can discourage copying.

Another interesting case is Infocom, maker of text adventures such as Zork. While all of its disks are copy protected, the system used is fairly standard and easily beatable by any nibble copier. Their *real* copy protection is the extra goodies provided with each package. For example, Deadline comes with a file full of evidence required to solve the murder case. Suspended comes with a map of the entire adventure, including counters with which you can keep track of the six robots used throughout the game. The latter case is perhaps the best example of a method that Infocom has employed both to add an interesting touch to the product and to make pirate copies much less appealing.

Other Infocom games, such as Spellbreaker, use less subtle means. This program comes with a small deck of cards containing many facts that really have little to do with the game. However, at one point, you are quizzed on one of the facts on one of the cards. The answer is found by consulting the deck provided with the original disk; it would be impossible to guess.

Software support is an important issue, especially regarding large business packages. Companies must ensure that they have a high level of quality support for legitimate owners. This includes toll-free hot-line phone numbers, knowledgeable tech-support representatives, and frequent updates. It's not uncommon that a company will require you to make a long-distance call, wait on hold for 20 minutes, and get batted around from person to person—only to find out that your question is so technical that the original software author is the only one who can answer it.

The video industry has found that the public is more prone to renting videocassettes than buying them. It is now a common pastime to spend five bucks to rent a couple of movies for a night and return them in the morning. Some titles, however, also were aimed at a buying public. These are the all-time classics such as "Gone with the Wind." In this case, special packaging is used to set this particular product apart from all the rest, treating it the way one would treat a classic book.

Finally, copy protection itself can add value to software games. A copy-protected game is two games in one. The first game is the one shown on the front cover. The second is the copy-protection system itself and how to remove it.

The software industry in general must find ways to deal with piracy. The first method that comes to mind, copy protection, generally detracts from the product's overall quality. Companies must find new and innovative alternatives such as those mentioned, which increase the perceived value of the product while they discourage copying.

Copy protection detracts from a product's overall quality.

From: Bill Berner <BERNER@SU-SCORE.ARPA>
Subject: Macintosh Cluster Managers' Mailing List

I run a computer cluster for the School of Engineering.

I am trying to compile a mailing list of other cluster managers so that we can ask each other for advice about hardware/software, strategies, and so on. I have even considered putting out a newsletter.

Computer cluster managers unite!

If you are a cluster manager, and you think that this would be useful, please send me your name and e-mail address. If you aren't a cluster manager, but know one (or know of one), please forward this message to them.

Thanks.

Bill Berner, Terman Microcomputer cluster manager

From: <OBRIEN@LL.ARPA>
Subject: Using Single-Sided Disks as Double-Sided

Besides the experiences mentioned in the Delphi digest (Info-Mac v4#11), has anyone else had good/bad luck using single-sided floppies as double-sided in the new double-sided drives? Do some brands work better than others? If this works, it would help us to avoid buying too many DS disks while the prices are initially steep.

Have you had success using single-sided floppies in double-sided drives?

Tom O'Brien - arpa: obrien@LL

From: STERNLIGHT@USC-ECL.ARPA
Subject: SS vs. DS Disks

In response to OBRIEN@LL's inquiry about SS vs. DS disks, I have considered this issue at length, and read the conversations on CompuServe and Info-Mac. The most telling point was that manufacturers don't know, when making the media, which side will end up facing the head; thus, theoretically, both sides are made to the same standards. It is stated, without proof, that SS disks are (take your choice) DS disks that have failed their certification on the obverse side, or that SS disks are DS disks that haven't been tested and certified on the obverse side (depending on the manufacturer, I suppose). One respondent on CompuServe suggested that even if Mr. Maxell and Mr.Sony personally came to his house and buffed his disk surfaces, he wouldn't trust even DS disks, and backs up everything he isn't prepared to lose. Apple, in the Macintosh Plus manual, warns in *red type* against using SS disks as DS. I suppose one issue is how much it costs if you lose data (in aggravation, if not in economic loss) compared to the cost of DS disks.

My own experience is that I have formatted about 50 SS disks as DS disks; three failed initialization, and of these, two initialized OK on the second try. *I have also had two disk jams with the Macintosh Plus, one in the external 800K drive, and one in the internal drive.* Both jams were not correctable by paper-clip-in-the-hole removal, and necessitated replacement of the drives by a service tech. Both were with very early Apple SS disks, bought when the Macintosh 128K first came out. As a result, my policy is as follows:

I won't use white SS disks as DS under any circumstances.

I will use those *blue* Sony and Fuji SS disks I have as DS on files I have backed up. They are all manufactured in the past year and are likely to be OK if they format OK.

Back up EVERYTHING!

When they are gone, I will use only DS Sony or Apple disks. It is a false economy to do otherwise. I already have three boxes of them. Sony DS Disks (original packaging, same as in stores) can be bought by mail for about $29.50 (plus $3 shipping).

Best,
David

From: R.Rasulis <ext715%BOSTONU.bitnet@WISCVM.arpa>
Subject: MS-WORD Faux Pas

Here's an unusual item:

Users of Microsoft Word, examine the cover to your Word manual. What do you see? Two people using a Macintosh. Look very closely at its screen. You would expect them to be using Word, but if you examine the menu bar, it looks a lot like MacWrite to me....

From: Frank Chen <Frank@SU-CSLI.ARPA>
Subject: Overheating vs. Power Surge Dilemma

I have a Macintosh 512K that I use every day for about 4 to 6 hours (on and off) in a given 12-hour period each day. My question is, is it better to leave the Macintosh on for the entire 12 hours—or even all the time, as Apple seems to suggest—or is it better to turn it on and off as I need it?

Question: Can I leave my Macintosh on and unused for long periods of time?

As for turning it on and off, this would obviously subject the system to a lot of wear and tear on the power supply. As for leaving it on, of course, I'd turn down the brightness whenever I'm not actively using it. However, this is a 512K, which I've heard frequently have problems with overheating and burning out (and I have no special fans to keep it cool).

Perhaps another way to phrase this question (particularly to those of you who may happen to repair Apple hardware) is "Among Macintosh 512Ks, which is more common, burned-out boards due to overheating or power-supply failures?" Or maybe a more practical question along the same line is "Which is more expensive to repair?"

Any qualified answers would be greatly appreciated!
Frank

From: Werner Uhrig <CMP.WERNER@R20.UTEXAS.EDU>
Subject: Re: Overheating vs. Power Surge Dilemma

Answer: Get a fan or the Fade-to-Black desk accessory.

Frank, put in a fan, make sure you have 5 Volt and 9 Volt, else adjust the voltage, leave your Macintosh on (mine runs for months at end), and use the Fade-to-Black desk accessory to protect from screen burnout. If you still experience analog-board problems, write it off to bad luck.

Werner

Disclaimer: Neither I nor anyone else takes responsibility for the above. Get professional help if you are afraid to break more than you fix. Just because it works for me doesn't mean anything—I am a Sunday child.

From: Lance Nakata <K.Kirin%LOTS-B@LOTS-B>
Subject: Mac Burnout

The discussion about possible damage to a Macintosh due to prolonged use is one that I have wondered about for a long time, yet it seems as though there aren't any definitive answers. There do, however, appear to be some good suggestions.

I believe that running a Macintosh continuously, even when it is not in use, could harm it in certain circumstances. I have a Macintosh 512K,

which gets quite warm after only two-plus hours, so I am thinking of getting a fan. This should allow me to run with 1 to 2 megs (when I upgrade), yet remain in a comfortable temperature range.

I vote for turning off the Macintosh whenever it is not in use.

I base my hesitations about running the Macintosh (*without* a fan) for extended periods on messages from the net about burned-out boards, and on the informal discussion I had with an employee for a Stanford computer systems group. This person has overseen the operation and maintenance of many Macintosh and Lisa computers, and is an absolute advocate of TURNING OFF the Macintosh whenever it isn't in use. A little extra work on the power supply is better than a burned-out board, of which he's seen his share. The structure of the Macintosh doesn't help matters either; air flow through the machine is often restricted when sitting in a small office on a hot day.

So this is the bottom line: Look into the feasibility/necessity of a fan if you do intensive work on the Macintosh, or if you leave the Macintosh on for days on end. By the way, blanking the screen will save your Macintosh from *screen* burnout, but the machine still gets warm.

Lance

From: Mark Scherfling <mrs2%gte-labs.csnet@CSNET-RELAY.ARPA>
Subject: Beware of Old Batteries

You might want to check your battery.

We had a weird problem arise recently. We have several Macintosh systems connected to AppleTalk with a LaserWriter. One day, one Macintosh would not print any documents containing MacPaint pictures (pasted into other documents or straight). This seemed odd, because it had been printing fine up to then. My first thought was something was wrong with the LaserWriter. The printing error that came up was "Err:Undefined;OffensiveCommand" followed by the "Error in PostScript" message. Other systems could print though. We have a very dry environment, so I thought static electricity might have zapped the Macintosh.

It was the battery! I replaced the bugger, and it worked like before. I have an idea—how about a desk accessory to check the battery and display its voltage, like the old analog VU meters. Something like this sure would have saved a week of confusion.

Cheers—Mark Scherfling

From: Tony Jacobs <T-JACOBS@UTAH-20.ARPA>
Subject: Customizing Finder 5.0 and Above

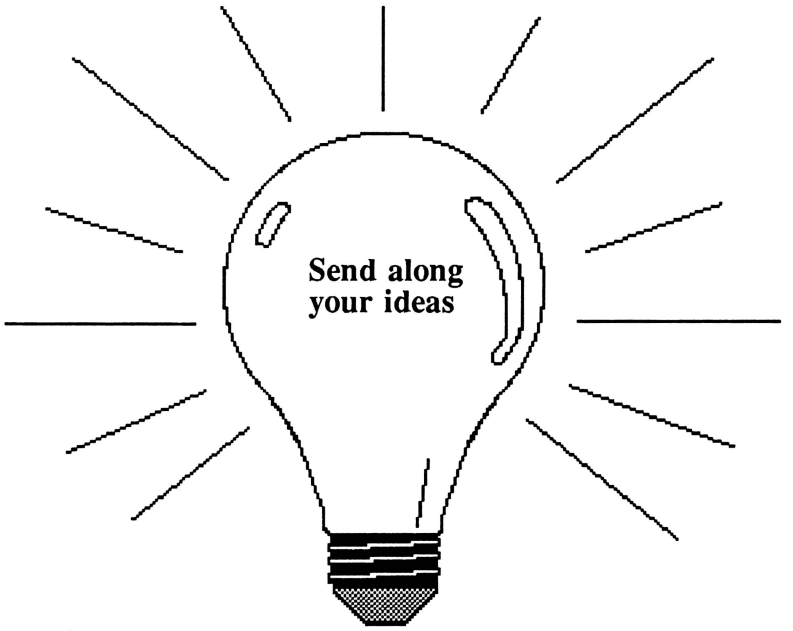
The new Finders have a new resource in them called LAYO (which I believe stands for Layout). The newest version of ResEdit has a

template for LAYOs, and you can therefore customize the layout of your Finder there. Among other things, it will let you set:

-icon grid spacing (for large and small icon modes)
-icon grid phase (for a staggered grid; this is great for making the icons closer together and staggered so the text doesn't overlap)
-font style and size
-window zooming rectangles (turning off speeds up window opening)
-tabs for window headers
-default window size and position
-other window parameters

Well, that's all for this issue. I'm looking forward to "chatting" with you in the summer issue of *Wheels*. If you have any suggestions or particular areas that you would be interested in reading about, please write and let me know. Take care.

Keep those cards and letters coming.



International

Worldwide Conference at Cambridge University, England

300 delegates from 100 universities from 37 countries.

Leading members of the academic and governmental communities of Europe, North and South America, Asia, and Australia were among the 300 delegates who attended the meeting, which began March 24. Individuals represented more than 100 universities from 37 different countries.

The intent of the three-day conference was to present information and share ideas about use of the Apple Macintosh in various academic disciplines.

Conference activities included a wide variety of presentations and events. In the morning, everyone attended lectures, which included both talks by leaders in particular disciplines and discussions by representatives from several of the universities in the U.S. Apple University Consortium.

Conference Activities

Each afternoon, delegates had several options, among them:

- Attending workshop discussions on topics of particular interest to them.
- Using a hands-on room to experiment with a wide variety of Macintosh software (from international schools, U.S. schools, and third-party vendors).
- Visiting a demonstration area where representatives from U.S. Consortium schools were demonstrating software they developed.
- Visiting a demonstration area where representatives from many of the international schools were demonstrating software they developed.
- Meeting with representatives from several commercial software vendors.

Throughout the Conference, the Macintosh was much in evidence. Many of the speakers used a Macintosh Plus (with Apple's Hard Disk 20) as an integral part of their presentation.

Presentation Highlights Keynote Speakers

John Sculley, Apple's president, chairman, and chief executive, talked of the university community becoming an academic village that might expand to global proportions, allowing information and knowledge to be shared both within campuses and across international boundaries. He went on to say that "the challenge for educators is to teach the rest of us to learn to cope with the acceleration of knowledge and to teach young people who are going to spend the majority of their lives in the 21st century in the process of learning."

The challenge for educators is to teach the rest of us.

Dr. David Thornburg, a lecturer at Stanford University, gave a keynote speech titled "Knowledge Structures: Conversing with Computers." He urged developers to develop more easily understood computer languages, using universal metaphors rather than the typical "unfriendly code" of a standard computer program. Dr. Thornburg went on to say that the difficulty of programming lies in the differences between the creative process and the medium used for the expression of ideas. He said that any efforts to create a "metaphor" between the programming process and the creative process would be very welcome.

Metaphors be with you.

Dr. Alan Brightman is Apple's manager of special education programs. In his talk, "Microcomputers and the Disabled Community: From Rhetoric to Reality," he elaborated on the unique promise microcomputers offer to disabled individuals. He then lamented the fact that it was less clear when that promise would be realized.

Dr. Brightman told Conference members that the biggest problem faced by the disabled is not their pain or their dependence upon others but the fact that able-bodied people regard them as different. He encouraged those in attendance to join with Apple Computer in its commitment to find and implement computer solutions for many of the problems facing those who are disabled.

Jean-Louis Gassée, Apple's vice president of Product Development, charged the educators attending the conference to "look toward utilizing personal computers in the schools as proactive learning machines that would be 'radars of discovery'". He went on to say that the schools of the future must turn out explorers who would ensure that our store of knowledge keeps doubling and that "the personal computer is the map and compass of that great adventure."

Schools must turn out explorers.

Yale University's **Dr. Robert Shank** spoke about artificial intelligence. He said that the entire AI and expert systems area is still in its infancy. "AI is really building machines that can reason about their own actions," he said. "No one in AI knows the answers,

AI is still in its infancy.

because we're still looking to see what the problems are. There is no way that machines will become intelligent unless they are capable of creating new rules."

The final keynote address of the Conference was delivered by Apple International President **Michael Spindler,** who encouraged the business and academic communities to develop closer ties.

Other Conference Speakers

Easy Macintosh development.

Dr. Jean-Marie Hullot, of the Ecole Polytechnique (France), showed attendees how to develop an object-oriented LeLisp application right on the Macintosh. As he spoke to the audience, Dr. Hullot actually started work on a Macintosh application— complete with windows, scroll bars, icons, dialog boxes, and mouse control. Within 15 minutes, he had designed and implemented a working Macintosh application using LeLisp (soon to be available).

The real new math.

Dr. Stephen Withers and **Dr. Neville Smythe** showed a videotape that clearly illustrated the high degree of computer awareness in many Australian universities. After the video showing, Dr. Smythe drew applause from the audience with a demonstration of the Australian National University's ANUGraph mathematical functions package. The program takes as input a mathematical formula, which is selected with the mouse from among a large variety of on-screen mathematical symbols. It is then quite easy to display graphs of the selected functions. Many felt that this type of product could revolutionize the way mathematics is taught.

Dr. William Arms, from Carnegie-Mellon University, gave a detailed overview of how the Macintosh can be integrated into a campuswide network that also includes several different mainframes and a variety of micros.

The desktop publishing revolution.

Dr. J. Michael Adams, from Drexel University, gave an excellent presentation on the revolution in printing caused by desktop publishing. He began with a brief historical perspective of the printing industry, and went on to describe how Macintosh computers can be interfaced with typesetting systems.

Dr. Peter Olivieri, editor of *Wheels for the Mind* and a faculty member at Boston College, gave a presentation detailing the strategies involved in introducing microcomputers to students, faculty, and administrators. In addition, he commented on ways in which microcomputing can become an integral part of the curriculum.

Dr. Brian Hawkins is on leave from Drexel University and is acting as a resource specialist to Apple Computer. He gave an overview of the microcomputing program at Drexel and described that institution's philosophy about integrating the computer into all phases of university life.

Dr. Michael Cartier, of the University of Quebec in Montreal, spoke about the interface of art, culture, and high technology. He suggested a new learning model for dealing with our rapidly changing societies. The aims of such a learning center would be to teach new technologies, to become a focal point for demonstrating these new technologies, and to carry out research and development activities.

New learning centers are needed.

Ultimately, these learning centers should develop new tools for teaching about technology (tools that are visual and unintimidating).

Seminar Series

The afternoon seminar sessions were designed to provide smaller groups of Conference attendees with the opportunity to obtain more information about specific applications. These seminars include the following:

The seminar pograms gave attendees the opportunity to hear panels of experts on a variety of topics.

- **The Macintosh as a Teaching Tool**
  — Teaching a Course on the Macintosh
  — Desktop Publishing
  — Artificial Intelligence
- **The Macintosh in the University**
  — Faculty Involvement in Microcomputers
  — Software Development on the Macintosh
  — First Steps in Microcomputing
- **Communications**
  — Global Networking
  — University Networking
  — Joint Projects
- **Distance Learning**
  — Networking and conferencing
- **Smalltalk and MacApp** (Dan Ingalls, Apple Computer)
- **Data Communication**
  — Connecting with the IBM, DEC, and UNIX environments (David Susarret, Apple Computer)

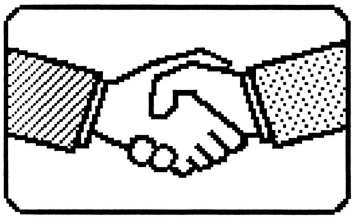
Conference Attendees

The list of universities and institutions represented by attendees at the Cambridge meeting is quite impressive.

Australia
Australian National University
The University of Melbourne

Austria
University of Linz (Austria)

Together, we can do great things.



There are lots of opportunities for joint international projects.

Austrian National Library
Austrian Parliament
Technical University of Vienna

Belgium
V.U.B.
U.L.G. - SEGI
F.N.D.P.
U.L.G. - I.P.N.
Kabinet Ministerie van Onderwijs
Advisor to the Council for Higher Education
K.U.L. Informatika

Canada
University of Alberta
University of Quebec in Montreal
University of British Columbia
University of Toronto Hospital for Sick Children

Chile
Universidad Catolica de Chile

China

Columbia
Universidad de Los Andes
Executive President, Consejo
Vice Minister of Education

Denmark
Arthus University

Egypt
American University of Cairo
Cairo University

Finland
University of Technology, Helsinki

France
Essec-Ecole Superieure des Sciences
Ecole Polytechnique
SUP de CO
I.N.P.G. - Institut National Polytechnique Grenoblois
Universite de Technologie de Compiegne
Supelec-Ecole Superieure D'lectricité
Ecole Normale Superieure

Greece
Patras University
Technical University of Athens
Thessaloniki University

Hong Kong
University of Hong Kong

Iceland
University of Iceland

Ireland
Trinity College
Department of Education

Israel
Tel Aviv University
Yeda Computers
Technion University of Technology

Italy
- University of Milan
- Informatica Universitaria Pisana
- University of Padua
- University of Pisa
- Universita Degli Studi di Milano
- University of Rome

Japan
- Keio University

Lebanon
- University of St. Joseph

Malaysia
- University Sains Malaysia
- University of Technology

Mexico
- Executive Secretary ANUIES
- Universidad Iberoamericana
- Instituto Technologico de Monterrey
- Universidad Nacional Autonoma de Mexico

Netherlands
- Academie voor Beeldende Kunsten
- HBO Council
- Universities of Amsterdam
- Director, Ministry of Education
- Katholieke Universiteit Nijmegen
- University of Rotterdam

New Zealand
- Otago University

Norway
- University of Oslo
- University of Bergen

Singapore
- National University of Singapore

Spain
- University of Valencia
- University of Salamanca
- Basque Government
- University of Pais Vasco
- CPD Madrid Central Government
- Universidad de Malaga
- Universidad de Castilla La Mancha
- University of Zaragoza
- Pontificia Comillas (Madrid)

Sweden
- Swedish National Board of Universities and Colleges
- Chalmers University of Technology
- Stockholms skolförvaltning
- Swedish Institute of Computer Science
- University of Göteborg
- Lund University
- Ministry of Education and Cultural Affairs
- Studentlitteratur
- Stockholm Institute of Education
- Uppsala University

Switzerland
- Swiss Federal Institute of Technology
- Institut für Informatik
- University of Zürich
- CERN Division EP

Thailand
- Chulalongkorn University

Turkey
- Orta Dogu Teknik Universitesi
- Marmara Universitesi
- Istanbul Universitesi

United Kingdom
- Open University
- University of London - Queen Mary College
- Glasgow University
- University of London - Kings College
- Imperial College of Science and Technology
- Cambridge University
- Aston University
- Queens University
- Reading University
- London School of Economics

United States
- Drexel University
- Carnegie-Mellon University
- Mississippi State University
- University of Texas at Austin
- Cornell Medical College
- University of Utah
- University of Oregon
- University of Michigan
- Stanford University
- Brown University
- Boston College
- Reed College
- Dartmouth College
- Yale University

Venezuela
- Universidad Metropolitana

West Germany
- Universität zu Köln
- Universität Karlsruhe
- Technische Universität München
- Universität Heidelberg
- Universität of Hamburg

Yugoslavia
- Zagreb University

University of Manitoba

Canadian update.

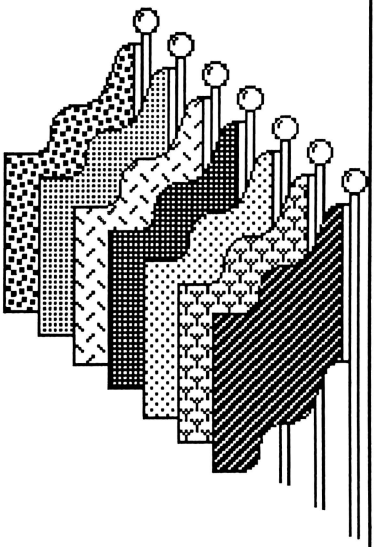
The Apple University Consortium contact at the University of Manitoba:

Gerry Miller
Assistant Director
Computer Services
603 Engineering Building
University of Manitoba
Canada

List of University Consortium Members Australia

Australian update.

- Wollongong University
- University of Tasmania
- University of Western Australia
- Western Australian Institute of Technology (WAIT)
- University of Adelaide
- The University of Melbourne
- NSW Institute of Technology
- Australia National University (ANUTECH)
- Sydney University
- New South Wales Institute of Technology



Macintosh and the 800K External Drive

The following configurations are recommended for use of the new 800K External Drive with the various Macintosh systems:

128K Macintosh—This configuration is not recommended; many applications will not run because of the significant amount of memory taken up by the RAM-based disk driver and file system. If you want to try anyway, place the following files in the System Folder of your startup disk:

- System 2.0 (creation date 5/4/85)
- Finder 4.1
- Hard Disk 20 1.0 (from Hard Disk 20 Startup)

You must start up from a 400K Macintosh File System (MFS) disk in the internal drive; it is not possible to start up from the external drive. *(Caution: This configuration does **not** allow you to use the Hierarchical File System, (HFS). Disks in the external drive will be formatted as 800K MFS volumes.)*

Macintosh 512K, unmodified—With a Macintosh 512K, you can use 800K HFS disks in the external drive by putting the following files in the System Folder of your startup disk:

- System 3.0 or later
- Finder 5.0 or later
- Hard Disk 20 1.0 or later

You must start up from a 400K MFS disk in the internal drive; it is not possible to start up from the external drive.

Macintosh XL—The 800K External Drive does not function with the XL, however, the following new system software works fine:

- Finder 5.1 or later
- System 3.1 or later

Macintosh 512K with 800K Internal Disk Drive or Macintosh Plus—With a Macintosh Plus, a Macintosh 512K upgraded to a Macintosh Plus, or an enhanced Macintosh 512K (with the 800K internal disk drive), you don't need to have the Hard Disk 20 file on your startup disks (if you have it, it will just be ignored). You can start up from 800K HFS volumes in either the internal or external drive, using the following software.

- Finder 5.0 or later
- System 3.0 or later

The software can be taken from the following disks:

- Hard Disk 20 Startup (Hard Disk 20, Finder 5.0, System 2.1)
- Macintosh Plus System Tools (Finder 5.1, System 3.0, ImageWriter 2.1, LaserWriter 1.1)
- Printer Installation (Finder 5.2, System 3.1, ImageWriter 2.2, LaserWriter 3.0)

Note that with System 3.0 or later, you use the Chooser desk accessory (rather than the Choose Printer), and that only ImageWriter 2.1 or later and LaserWriter 1.1 or later are compatible with Chooser.

Programming Aids

The Extender is a powerful programming tool, which novices as well as advanced programmers will find a tremendous timesaver in program development. Pascal Extender and C Extender are run-time libraries that contain routines designed to simplify and enhance Macintosh interface programming. After installing the libraries on the language disk, the Extender routines are called as easily as any other library routines.

Features include:

- **Windows**— A single function call will create a window, set up vertical and horizontal scroll bars, a "go-away box," and a "growbox" as desired. The following operations for handling windows are supported automatically without requiring any input from the programmer (although advanced programmers may make modifications easily).

  —Window resizing with automatic updating of text or graphics and scroll bar repositioning.
  —Updating of all windows (no limit on the number of windows displayed except memory).
  —Window selection and "dragging."
  —Showing and hiding windows.
  —Automatic cursor adjustments (for example, from arrow to I-beam).
  —Automatic scrolling of graphics ot text.

- **Menus**—A single procedure call will both create and display a customized pull-down menu. Special features, such as keyboard equivalents, highlighting, disabling (graying of selected items), checkmarks, and displaying items in other fonts, can be included in the procedure as desired. Menu items can be changed in midprogram and can be created in the program or read directly from resource files. Menu selections are read automatically.

- **Controls**—Single procedure calls create push buttons, check boxes, and "radio buttons" with custom titles, full mouse tracking, and automatic highlighting and disabling. All control-related events are reported directly to the user; no polling of controls is required.

- **Scroll Bars**—A single procedure call creates a horizontal or vertical scroll bar of any size and controls its placement. Scrolling and paging increments are controlled automatically.

- **Graphics Printing**—A single command will print the contents of any window or Grafport up to one full page (8.5 x 11 inches) on the ImageWriter or LaserWriter printer.

- **Desk Accessories**—Desk Accessories are fully supported automatically.

- **Text Editing**—All text-editing features (TextEdit) are fully supported, including selecting, cutting, copying, and pasting text, as well as changing size and font. In addition, cutting and pasting to and from the System Clipboard is also fully supported. Automatically controlled features include:
  —Full support of multiple text records on multiple windows.
  —Horizontal and vertical text scrolling.
  —Word wrap.

- **Dialog and Alert Boxes**—Dialog and alert boxes in resource files can be easily called up and modified as desired. Text entered in dialog boxes is easily read by your program.

The Extender code uses standard Apple Toolbox data structures; therefore, all direct "Inline" Toolbox calls remain supported and will function as expected. Many user "hooks" are provided so that the advanced programmer can choose to take control of any or all events, including:

- Window handling.

- Keyboard events.

- Menu handling.

- Graphics and text scrolling.

Particular windows can be declared as "exceptions" to be handled by your own routines while allowing other windows to be handled automatically by the Extender. Thus, the programmer can freely intermix high-level handling of routine events with special low-level calls as desired. In addition, the Extender provides a large number of optional medium-level procedures that can be used by the advanced programmer to modify the standard Extender procedures and functions.

Extender versions for compilers use about 10K. Pascal Extender for the Apple Pascal interpreter uses about 20K.

A book-length manual (200 pages) is provided with tutorial, reference, index, and numerous sample programs.

There are no extra royalty fees if you market programs created with the Extender.

PASCAL EXTENDER for:

Apple Macintosh Pascal Interpreter	$69.95
TML MacLanguage Series Pascal	$69.95

C EXTENDER for:

Aztec C	$129.95
Megamax C	$129.95

PASCAL and C EXTENDER COMBINATION PACKAGE (2 disks and 2 manuals)	$179.95

PASCAL INTERPRETER + TML COMPILER EXTENDER COMBINATION PACKAGE (2 disks and 1 manual)	$119.95

For information or to purchase, contact:

INVENTION SOFTWARE CORPORATION
P.O. Box 3168
Ann Arbor, MI 48106
(313) 996-8108

Macintosh Plus Specifications

Processor:
MC68000, 32-bit internal architecture, 7.8336-megahertz clock frequency

Memory:
1 megabyte RAM
128K ROM
Includes 256 bytes of user-settable-parameter memory

Disk Capacity:
800K per formatted double-sided disk
3 1/2-inch, hard-shell media

Screen:
9-inch diagonal monochrome display
512 by 342 pixels, bit mapped

Interfaces:
Synchronous serial keyboard bus
Two RS-232/RS-422 serial ports (230.4 kilobaud maximum)
Mouse interface
External disk-drive interface
SCSI interface (320K bytes per second maximum)

Sound Generator:
4-voice sound with 8-bit digital-analog conversion using 22-kilohertz sample rate

Input
Line voltage: 105 to 125 volts AC, RMS
Frequency: 50 or 60 hertz
Power: 60 watts

Keyboard:
78 key, 2-key rollover, software mapped, detachable, with built-in numeric keypad and direction keys

Mouse:
Mechanical tracking, optical shaft encoding 3.54 pulse per mm (90 pulse per inch) of travel

Clock/Calendar:
CMOS custom chip with 4.5 volt (Eveready No. 523 or equivalent) user-replaceable battery backup

Dimensions	Weight	Height	Width	Depth
Main Unit	7.5 kg 16 lb.8 oz.	344 mm 13.5 in.	246 mm 9.7 in.	276mm 10.9 in.
Keyboard	1.2 kg 2 lb.10 oz.	65 mm 2.6 in.	395.4 mm 15.6 in.	146 mm 5.8 in.
Mouse	2 kg 7 oz.	37 mm 1.5 in.	60 mm 2.4 in.	109 mm 4.3 in.

Environment

Operating Temperature: 50° to 104° F (10° to 40° C)
Storing Temperature: -40° to 122° F (-40° to 50° C)
Humidity, all conditions: 5% to 90%
Altitude: 0 to 15,000 feet (0 to 4615 m) ●

LaserWriter Plus Specifications

Marking Engine:
Canon LBP-CX laser-xerographic engine

Processor:
Motorola 68000, 12-megahertz clock speed

Memory:
1 megabyte ROM
1 1/2 megabytes RAM

Interface:
AppleTalk and RS-232C

Print Quality:
All text and graphics printed at 300 by 300 dots per square inch

Built-in Fonts:
Helvetica, Times, Courier, Symbol,
Palatino, ITC Avant Garde Gothic, ITC Bookman,
Helvetica Narrow, New Century Schoolbook,
ITC Zapf Chancery, ITC Zapf Dingbats

Speed:
8 pages per minute maximum throughput

Printing Protocols:
PostScript, and a subset of the Diablo 630 command set

Print Materials:
Letter, Legal, A4, B5 sizes
16- to 20-lb. single-sheet photocopy bond
8- to 34-lb. letterhead and colored stock
Transparency overhead film
Envelopes and labels supported via manual feed

Printable Surface
Letter size: 8 by 10.9 inches
Legal size: 6.75 by 13 inches
A4: 7.41 by 10.86 inches
B5: 7.69 by 10.16 inches

Dimensions

Weight	Height	Width	Depth
77 lbs.	11.5 in.	18.5 in.	16.2 in.

(Depth is 28.2 inches with trays attached)

Power:
U.S. Model: 115 VAC (+ 10 percent) 60 hertz

Macintosh 800K External Drive Specifications

Disk Capacity:
800K per formatted double-sided disk
1246K per unformatted double-sided disk

Recording Media:
3 1/2-inch hard-shell media
2 recording surfaces
80 tracks per inch

Interface:
Connects directly to the Macintosh or
Macintosh Plus disk-drive port

Characteristics
Seek Time: 6 milliseconds maximum (track to track)
Settle Time: 30 milliseconds maximum
Drive Startup Time: 600 milliseconds maximum

Power Requirements:
+12 volts
Standby: 10 microamps
Typical: 120 milliamps
Peak: 600 milliamps (during eject, 2-second maximum duration) +5 volts
Standby: 10 milliamps
Typical: 200 milliamps

Head Position:
+/-0.035 millimeters

Dimensions

Weight	Height	Width	Depth
1.29 kg	48.5 mm	120 mm	200 mm
2.84 lbs.	1.91 in.	4.72 in.	7.87 in.

Environment
Operating
Ambient Temperature: 40° to 122° F (5° to 50° C)
Relative Humidity: 5% to 90%
Nonoperating
Ambient Temperature: -40° to 140° F (-40° to 60° C)
Relative Humidity: 5% to 90%

The New ROM in the Macintosh Plus

This article explains some of the things that have been enhanced in the new ROM. First of all, the hierarchical filing system that Apple has been shipping as RAM-based with the Hard Disk 20 is now in ROM. Also, the ROM has been modified so that it is now capable of starting up directly from a hard disk (no 3 1/2-inch disk required).

The new ROM is designed to enhance performance as much as possible without sacrificing compatibility with existing applications. Here are some of the new features and performance enhancements:

QuickDraw, which was already very fast, has gotten even faster; for example, the speed of special cases of CopyBits has tripled. Other performance enhancements include FillRect, PaintOval, and PaintRRect. By popular demand, QuickDraw now includes the routines that form the basis of the MacPaint program lasso and paint bucket tools. These calls, named CalcMask and SeedFill, will help you add these features to your programs.

The Resource Manager has been made faster. It now uses a smarter algorithm for compacting a resource file, one of the slowest parts of the old Resource Manager. It also uses various caching techniques to make itself faster. In addition, the Resource Manager has implemented a set of calls that search for a resource only in the current resource map. These calls, called "one-deep" calls, will speed up your performance if you only want to search the current map.

The Window Manager and the standard window definition function (WDEF 0) now implement window zooming. This new feature allows you to expand a window to full size by clicking in a special "zoom box" that appears at the top right corner of the window frame. Clicking in the zoom box of a window that's already full-size causes it to shrink to its previous size.

The standard menu definition procedure (MDEF 0) has been enhanced, too. It now allows menus that are too long to fit on the screen to scroll when the user drags below the last visible item. This feature is great for folks who like to have lots of fonts, because all the fonts will now be accessible from the font menu.

With the doubling in size, the new ROM is able to accommodate lots of things that had to be loaded into RAM on the old system. For example, both of the floating-point math packages (PACK 4 and PACK 5) are now in ROM, as is the binary-decimal conversion package (PACK 7). Most of the standard definition procedures are also in ROM—CDEF 0 and 1, MDEF 0, and WDEF 0—along with the AppleTalk drivers .MPP and .ATP.

(The material above was written by Scott Knaster of Apple for the January 1986 issue of *Outside Apple.*) ●

LaserWriter Fonts vs. Screen Fonts

The LaserWriter can print its built-in fonts both beautifully and quickly because of the way these fonts are designed. To understand why, you must remember that the LaserWriter has a resolution of 300 dots per inch, compared to the 75 dots per inch on the Macintosh screen. The fonts you see on your Macintosh screen, called screen fonts, are designed for the screen's 75-dot-per-inch resolution. So when you print one of these screen fonts, such as London, on the LaserWriter, you can actually see the dots it's designed with. Even with smoothing (a LaserWriter instruction that smoothes curves by adding dots), the printed screen fonts don't look as sharp as LaserWriter printer fonts.

That's because, unlike screen fonts, which are designed and stored for each point size, printer fonts are designed and stored as outlines. PostScript processes these outlines, and creates bitmaps—on the fly—at 300 dots per inch. These are perfect 300-dot-per-inch characters, regardless of the point size.

In fact, in addition to being point-size and orientation independent, the process is also device independent. You can print from your Macintosh computer onto all other AppleTalk/PostScript printers. For example, you can print on the Linotronic 300/P, a laser typesetter, at 2,450 dots per inch.

As for the speed issue, the LaserWriter prints its built-in fonts more quickly because it has the stored outline of the fonts. When printing a screen font, the printer has to spend time generating a 300-dot-per-inch bitmap from a 75-dot-per-inch bitmap, which involves a lot of time-consuming conversions.

(Adapted from an interview with Elizabeth Yerxa, LaserWriter printer product manager. Interviewed by Joanne Koltnow for the January 1986 issue of *Outside Apple*.)

Applications:

Hints, Tips and Techniques

This section of ***Wheels for the Mind*** contains hints, tips, and techniques gathered from software authors, vendors, users, publications, user groups, and just about anywhere else. The section is cumulative; each issue, new tips will appear preceded by an Apple logo . If you have tips to share, please send them along to the editor: Peter Olivieri, Computer Sciences, Boston College, Fulton 430, Chestnut Hill, MA 02167.

MACPAINT

Many thanks to MacPaint author Bill Atkinson, who provided these great MacPaint tips.

CONSTRAINING IS A GREAT TOOL. When you use the Shift key in conjunction with some of the tools in MacPaint, the results can be quite impressive.

Shift - Using this while in FatBits will help you fill in straight lines, both vertically and horizontally. I'll bet everyone has tried it freehand at one time or another with little success.

Shift - This allows you to erase areas without "wandering" into other areas of your drawing that you want to leave untouched.

Shift - This gives some great effects. Try using the "fence" brush shape with Shift key and you'll get some nice borders.

Shift - This can be used to move the screen up and down (or left and right) without straying from your intended course. This also works quite nicely in Show Page mode.

Shift - This makes perfect squares.

Shift - This makes perfect circles.

FAST FATBITS. If you have selected, hold down the ⌘ key and click your cursor at the spot where you want FatBits to be displayed. This is an amazingly fast way to get in and out of FatBits. It is much better than double-clicking or using the menu to do this.

MULTICOPY. Holding down the ⌘ and Option keys while dragging creates some interesting features. They are best explained with a demonstration, so please sit down at a Macintosh and try these.

DOTTED LINES AND CIRCLES. Select a line width that is fairly large. Select a brush shape that is a dot (not too big a dot). Use the tool to place a dot on the screen. the dot. Use the multicopy technique to draw a dotted line. Try making a dotted circle.

Shift with the multicopy technique does some neat constraining. Try this: Draw a rectangle with a decent-size border. Suppose the rectangle is not quite long enough. Use the icon to select the right half of it; use Shift with multicopy to stretch the rectangle to the right. Better yet, try this: Fill in the rectangle with a "noisy" pattern of your choice. If you now try the Shift multicopy technique (preceding), the pattern will not "stretch" correctly. Do not despair. Go to the Goodies menu and select Grid. Now try the Shift multicopy method, and the pattern will copy as well. Try this; you'll like it! Bill Atkinson calls this technique the "three-finger stretch."

UNDO is much easier if you use the upper left key on the keyboard. That's right, it works just like the menu item for Undo but lets you react faster.

TRANSPARENT PAINT is a neat effect. Try the following. Paint several stripes on the screen. Paint another color across them. Notice that the last stripe painted is opaque. Now hold down the ⌘ while painting another stripe . . . you get transparent paint. If you select the filled-in tool, you can even draw a background "behind" what is on the screen. This technique also allows you to paint near curved or straight lines without spilling over onto the line itself. (You've all done that!) Try these...you'll be impressed.

PATTERN GRABBING. Let's suppose that a friend gives you a disk that has some neat patterns on it that you'd like to have. You really don't want to go to the trouble of editing a pattern in detail. Try this: Paint the pattern of interest onto the screen somewhere. Double-click on a pattern in the pattern palette that you won't mind replacing. When the "pattern edit" box appears, move to your document and just click somewhere on the pattern you like. That's it. It's yours.

TYPING TEXT. Sometimes when you're in text mode you would like to change styles (perhaps do something in bold). However, when you click the mouse to change styles and then click again to start typing, you often can't easily line up the typing so it looks continuous. If you press Enter instead of clicking, all your typing will be on a straight line.

SAVING MACPAINT SPACE. If you have a lot of MacPaint pictures, you may be using a lot of space on your disk. If some of your "drawings" are not a full page, you can get some of your space back. The technique is to "combine" some of your pictures. If you get two pictures on a single document, you will save about 2K per document. It adds up!

MACPAINT 1.4 BUG. When using MacPaint Version 1.4 on a Macintosh 512K, you can crash the application with a system error if you use Show Page after opening an old document. You can get around this problem by opening MacPaint from the desktop and then using the "Open" command to get at the document of interest.

QUICK EXIT. Lots of current users are leaving MacPaint the fast way: Hold down the ⌘ key while choosing Quit from the file menu. The disk ejects, the tone sounds, and the Macintosh reboots. However, you really shouldn't use this method, as it doesn't guarantee that your disk directory will be in perfect order.

Double-Click on any pattern and you can edit/create your own pattern.

Double-Click on the icon and the full page is displayed.

MOVING OBJECTS . If you use the icon to move and copy objects, the "white background" that follows when you use the icon stays behind. This is especially useful when overlaying one picture onto another. In effect, the captures only the object that is selected.

PLACING OBJECTS ON TOP OF OTHER OBJECTS. If you wish to make an item transparent (say the lenses in a pair of eyeglasses), leave a little break in the frames where the lenses are. Using the icon will allow you to capture only the "borders" of the frames and allow the final object to look like real eyeglasses (that is, you can "see" through them). Try this to get the full effect. If you wish, you can then use FatBits to "repair" the breaks in the frame.

MAKING AN EXACT COPY OF AN OBJECT. After you select an object with the icon or the icon, you can make an exact copy by holding down the ø key, pointing to your object (make sure an arrow appears), pressing down the mouse button, and then dragging to a new location. Letting up on the button places your copy on the page. You can continue making as many copies as you wish.

MAKING MULTIPLE COPIES OF AN OBJECT. You can make repeating copies (a nice effect) by selecting an object with the icon or the icon, holding down both the Option key and the ⌘ key, pointing at the object until an arrow appears, and then dragging the mouse while holding the button down. Interesting note: The current line width determines how much space will be between repeating copies as you do the dragging. Try some different line widths to get a feel for this.

STRETCHING AN OBJECT. Select the object, using the icon. Hold down the ⌘ key and point to one of the edges of the enclosed figure. When an arrow appears, hold down the mouse button, drag the enclosed area left or right (maybe up or down), and watch your object stretch!

ENLARGING AN OBJECT. When you paste an object onto the screen, it returns in the same size that it was cut (or copied). You can cause it to return as a larger or smaller image than the original. Before you paste, use the icon to place a border rectangle on the screen. Make the size of this rectangle equal to the size you would like your object to be. When you now use the Paste option, your object gets resized accordingly.

CHANGING FONTS AND TEXT SIZE. Sometimes it's awkward to use the mouse and menu system for changing font styles or type sizes. If you hold down the ⌘ key and the Shift key, and then press >, you will automatically call the next font. Each time you press > you will call another font. To try different text sizes, just hold down the ⌘ key while you press >. After trying this for a bit, you may prefer to use this technique all the time.

AUTOMATIC MACPAINT DOCUMENT. If you hold down the ⌘ key and the Shift key and then press 3, the current screen will be saved as a MacPaint document called SCREEN0. (You can save 10 such "paintings.") That drawing is now available to you in MacPaint. This allows for some very creative applications.

NO BORDERS. If you select the dotted line from the border palette, your filled rectangles and circles will have no outline.

HIDDEN FEATURE. Select a drawing with the ≈ icon and hold down the Shift key. Select Trace Edges from the Edit menu and your drawing will now have a shadow.

CUSTOM PATTERNS. If you create a MacPaint document that contains several boxes with various patterns that you designed, you can easily call them up while drawing and transfer them to your pattern menu at the bottom of the page. Just use Cut and Paste to transfer a pattern from your MacPaint pattern collection to the pattern you wish to edit.

TRANSPARENT PAINT. You can paint with transparent paint. Hold down the ⌘ key and use the , , or .

CATALOGS. In the Goodies menu, there is a Print Catalog selection. Using this command, you can get a one-inch-square "picture" of all of the MacPaint pictures on your disk. It makes a handy reference.

SAVE SPACE. MacPaint does not need the ImageWriter resource in your System Folder. You can trash it and get a little more space on your disk.

SAVE MORE SPACE. If you have a copy of the Resource Editor, you can examine the MacPaint disk and remove the "pictures" that display "Short Cuts" and the "Introduction." This will save about 13K.

ERASING. Another way to erase things in MacPaint is to choose white paint, choose the filled-in rectangle, and draw a box with no border (dotted line from line type choices). You can then "erase" by drawing a white box over the unwanted material (assuming your background is white).

SHADOWS. Select a part of your drawing by using the , and then hold down the Shift key and choose Trace Edges from the EDIT menu.

MACTERMINAL

The following keystroke combinations may be of interest to users of MacTerminal:

⌘	H	Backspaces cursor one space
⌘	I	Moves cursor to right to next Tab
⌘	J	Moves cursor down one line
⌘	K	Moves cursor down two lines
⌘	M	Moves cursor back to start of line
⌘	G	Causes tone to sound

MACWRITE

CHARACTER ACCENTS. To use an accent, umlaut, and other characters in conjunction with letters, do the following: First press the key combination that produces the special character (look at Key Caps to see what combination is required), then type the letter you want in that same position. The ^ and the ` work only with the lower-case vowels. The ´ also works with E. The ~ can be used with a, o, n, and N. The ¨ works with lower-case vowels and upper-case A, O, and U.

IMAGEWRITER SWITCHES can control your printer in a variety of ways. There are two sets of switches on the ImageWriter. The first set, called SW1, controls some of the features of draft-mode printing. SW2, the second set, has switches that can cause irregularities in your printing if they are not properly set. If you want to use a foreign language set for draft printing, you can change the switches marked 1, 2, and 3. The settings for different character sets can be found in your ImageWriter user's manual (page 44). The pitch can also be modified with switches 6 and 7 (see page 41).

SW2 has three switches that will affect printing in any resolution if not correctly set. Switches 1 and 2 control the baud rate. MacWrite and Multiplan both need 9600 baud (both switches closed—see page 39). Switch 3 controls the XOn/XOff protocol. If the setting is not correct, you will get a dialog box that says "Printer Is Not Responding."

DOUBLE LINES can be created in MacWrite by choosing Underline from the Style menu and then typing with the underscore character (SHIFT -). To get the "double line" under words, you must enter a double line for a few spaces, then begin typing your words, and then end with your double lines again. This feature does not work on the LaserWriter printer yet.

MACWRITE DOCUMENT SIZE. A MacWrite document on a Macintosh 128K is limited to about 27,000 characters. This is nearly 5,000 words, or 20 double-spaced pages, in 12-point type. If you use a lot of fancy fonts and graphics in your paper, you won't be able to have as many pages. With a Macintosh 512K, you can have about 80 double-spaced pages (roughly 20,000 words).

QUICK ERASING. To erase some text, select it in the usual way and press the [Backspace] key. It's gone! You may prefer to use Cut or Copy if the text will be used again. Another alternative is to select the text and begin typing the new material. The new material will automatically replace all of what you selected.

SAVE SOME MACWRITE SPACE. On your MacWrite disk, put the Sample Memo in the Trash (saves 3K). Even more space can be saved if you remove fonts that you really never expect to use. This can easily be done by using the Font Mover application. Be careful not to remove any of the System Fonts.

SAVE MORE MACWRITE SPACE. If you save your documents without special fonts, rulers, and pictures, you can save up to 30 percent of the space consumed by that document. Thus, until you're ready for final copy, you might consider saving your documents using Text Only. This is one of the options in the Print dialog box.

SAVE PAPER. When you get the dialog box for printing, fill in the requests for beginning and ending page numbers. The last page will not be ejected from the printer, and no blank pages will be printed.

REPLACING DELETED LETTERS. Ever use the [Backspace] key to erase letters and wish you had them back? Try using the [⌘] key together with the [Backspace] key and the letters will return. (The cursor will even move forward.)

SAVE SELECTION TIME. To select large areas of a document, click at the starting point, use the scroll box to find the end point for the selection, hold down the Shift key, and click again. The whole area is selected. This is called Shift-clicking and is not known by many MacWrite users.

FAST WORDS. Select an entire word by doing a [Double-Click] on it.

WIDER PAGES. You can have a right margin that extends past the 7 1/4-inch mark. Grab the title bar of your document and move the window a few inches to the left. Then use the size box to make the window wider on the right side. You can then extend the right margin marker.

HOW BIG IT IS. Sometimes you might want to know how much memory you have left for your MacWrite document. If you are in MacWrite, you can choose the "About MacWrite" selection from the Apple menu. You will be shown the amount of memory left for your current work.

UNABLE TO CREATE A NEW DOCUMENT. MacWrite 4.5 requires at least 11K on the application disk to create a new document; otherwise, a dialog box stating "The disk to too full to create a new document" is displayed. You may, however, open previously created documents.

Before you create a new MacWrite document, free up space on the application disk if you need to by moving documents stored on that disk onto other disks. Additional storage room may be obtained by removing excess fonts and desktop tools.

Here is a technique enabling you to open "new" documents when little room exists on the startup disk:

1. Free up room on your MacWrite disk.
2. Create and save a totally blank document onto a disk, preferably onto your data disk.
3. Whenever you need a "new" document, open your empty "template," then save it immediately under another name.

FINDING TABS. If you want to find the [Tab] key (or change it to something else), the Find or Change dialogs do not let you type the [Tab] character. Fool the dialog by cutting or copying a [Tab] character from within your text and pasting it in the Find or Change dialog box.

VERSION NUMBERS. If you are using a 128K Macintosh, you will be better off using MacWrite Version 2.2. If you are using a Macintosh 512K or a Macintosh Plus, you should use MacWrite Version 4.5.

LOST? If you lose your place while scrolling around in MacWrite, you can find where you were by pressing [Enter]. This will return you to the blinking cursor.

FASTER ERASE. If you hold down the [Enter] key while selecting text, that text disappears immediately when you release the [Enter] key.

PRINTING TAKES DISK SPACE. When printing a document using MacWrite 2.2, you will need to have room on the disk containing the System Folder that is about twice the size of the document to be printed. A temporary print file is written there. With MacWrite 4.5, the temporary

file requires only 10K, regardless of the size of the original. NO TEMPORARY SPACE is ever needed if you print in draft mode.

MISCELLANEOUS HINTS

DON'T TRY IT. A telephone extension cord may NOT be used as a substitute for the keyboard cord on your Macintosh.

WARNING. Do not place an external speaker too close to your disk drive. Its magnetic field may cause problems with your data on disk. This is particularly important as users begin to attach speakers for such applications as MusicWorks and SmoothTalker.

DON'T ASK. If you're in the habit of swapping disks a lot and there are a number of disk icons on your desktop, you can save yourself some time. After you have ejected a disk that you think you won't use for awhile, put the disk icon in the Trash. The Macintosh will forget about its presence and not bother asking you for it.

MULTIPLE DESK ITEMS. You can have multiple Note Pads (or Scrapbooks) available on your disk. Simply rename the Note Pad "Note Pad #2" (or some other meaningful name). The system will then create a new Note Pad and only look at that Note Pad file. You can rename any of your other Note Pads to that name and look at them whenever you wish. Be careful when renaming, think through what you're trying to accomplish. Also, multiple Note Pads will take up disk space, so don't plan on keeping too many of them.

WATCH THAT BATTERY. The battery in your Macintosh does more than just run the clock. It helps maintain 20 bytes (characters) of information about which ports are used for your printer and modem. If your battery is running low, your printer may stop working. If this happens, just exit the application, turn off the Macintosh, and take out the battery. The Macintosh then uses regular current to get the required information. Eventually, of course, you will want to replace your battery.

RESOURCE FONTS. It's not necessary to store fonts in the System File. They can be installed as the resource font of an application or application document. Once installed as a document resource, such a font can be used by someone who doesn't have that particular font in their System Folder.

CHANGING STARTUP DISKS. An easy way to change startup disks while you're in the midst of your work is to hold down [⌘] and [Option] at the same time and double-click on the Finder icon of interest. The disk with that Finder icon will now be identified by the Macintosh as the startup disk. (It will appear in the upper right corner of the desktop.)

SPACE RACE. Never work with less than 20K of free space on a disk. If you try to print a MacWrite document with less space, you may ruin the document. You will probably need a good deal more free space for your MacPaint creations. It would be a good idea to begin to have "storage disks" for finished work, and "working disks" for daily creations.

PRINT A WINDOW. You can get an instant copy of the active window by holding down the [⌘] key and the [Shift] key and pressing the number 4.

PRINT A SCREEN. You can get an instant copy of the current screen by pressing the [Caps Lock] key. Then hold down the [⌘] key and the [Shift] key, and press the number 4.

DON'T REJECT EJECT. You should always use the Eject option to remove your disks from the internal and/or external drive. Other methods may result in a loss of your disk directory or files. Better safe than sorry.

BACK UP A BIT. Always, always make a backup copy of disks that are important to you. With the Macintosh, this is a very easy process. Either use the application called Disk Copy or drag the icon of the original disk on top of the icon of the one to be used as a backup. Be advised: Using the Disk Copy application is faster if you have only one disk drive. (Treat yourself! Buy a second disk drive as soon as possible.)

EASY PRINTING. You can print your documents or pictures directly from the desktop. (1) Select the item (or items) that you want printed. (2) Choose the Print option from the File menu. (3) Select the appropriate settings (they'll be the same if you have chosen to print several documents).

SAVE ENTRY TIME. Pressing the [Enter] key is the same as clicking OK in a dialog box.

EJECTING. Eject disks by holding down the [⌘] key and pressing E . If you have two disk drives, arrange the desktop so that the two disk icons appear. Type [⌘] A (selects all icons). Then type [⌘] E (ejects all disks).

DISK DIRECTORY. You can get a printed copy of your disk directory by clicking on the [💾] Icon to get the window of contents. Select by name from the View menu. Now print the active window by holding down the [⌘] key and the [Shift] key and pressing 4.

MOVING WINDOWS. If you hold down the [⌘] key before you drag a window somewhere, you can drag it without making that window active.

CALCULATOR CALCULATIONS. Cut and paste a number (or a series of arithmetic operations) to the calculator and watch it work automatically. You can also use the keyboard to operate the calculator.

FIXING CRASHED DISKS. If you have a disk that is no longer working, try the following. Hold down the [Option] key and the [⌘] key while booting that disk.

WHAT'S IN A NAME. Disk names must be 27 characters or less. Application names, folder names, and document names must be less than 63 characters. Do not use a : or a . in any of your names.

SPARE SPACE. You should always ensure that there is some space on the disk that contains your application (MacWrite, MacPaint, and so forth). This is true even if you're saving your work on an entirely different disk. The reason is that MacWrite needs disk space to store a copy of your document temporarily before it prints it out. MacPaint needs space to store old versions of what you're drawing. Keeping 80K to 100K of space should be more than sufficient.

WINKING AT YOU. If you see the menu title blinking at you, it means that the alarm clock has gone off, and you did not know about it. Shut off the alarm (use the desk accessory menu).

BACK-BACKSPACE. If you have pressed the [Backspace] key too many times, you can retrieve the deleted characters by pressing [⌘] [Backspace] .

ALPHABET SOUP. The dialog boxes that display lists of file names are in alphabetical order. If you type the first one or two characters of the file you want to find, they will be found very quickly. This saves a lot of scrolling. Numbers in names appear before letters. Files copied onto the disk appear at the top of the list (not alphabetized). If you rename such files, they will then be alphabetized properly.

ORDERLY PRINTING. If you are on the desktop and wish to print files from there in a specific order, use the [Shift] [Click] technique to select each file. They will then print in the order that you selected them.

PLAY IT AGAIN SAM. Pressing the [⌘] key as you pick QUIT to exit an application will cause your system to reboot.

MULTIPLAN

In Multiplan, numbers will appear in cells as right justified. Letters or text will appear left justified. Recognizing this can sometimes help in identify typing mistakes (such as using an L instead of a 1). Do not use commas or $ as part of your numeric data input. Cells can be formatted later to include them.

INTERNATIONAL MULTIPLAN versions are available. Microsoft has already developed a French and an Italian version of this spreadsheet. More adaptations are sure to follow.

HEADERS AND FOOTERS. In Multiplan, you sometimes create a text header or footer that's too long to view in the Multiplan header box. Insert the I-beam somewhere in the header (or footer) text and drag it to the right until it bumps into the right edge of the header box. Your text will then scroll into view. The speed of the scroll is related to the distance between the I-beam and the edge of the box.

THE INSANELY GREAT OPTION KEY

WIDER SPACES. Pressing [Option] spacebar while in MacWrite will give you a wider space between words. It also will prevent the two words so connected from being split at the end of a line. Very helpful when writing equations and such.

SWITCHER. Do not bother choosing Always Convert Clipboard when using Switcher. If you hold down the [Option] key while you are "switching," the Clipboard will be converted for you.

MESSY ICONS. If you hold down the [Option] key while choosing Clean Up from the desktop, the icons in the currently active window will align themselves nicely in the left part of the window.

LONG HYPHENS. Pressing [Shift] [Option] - will type an em dash (a longer hyphen; you get — instead of -).

ACCENTS. The [Option] key helps with accents. Here are the possibilities:

To get a ~ press Option -n and then a, o, n, or N
To get a ¨ press Option -u and then a, e, i, o, u, A, O, or U
To get a ^ press Option -i and then a, e, i, o, or u
To get a ´ press Option -e and then a, e, i, o, or u

QUICK CHANGE. In MacPaint, Option quickly changes the to a .

LEAVE IT BEHIND. When in MacPaint. use the or the to select something. Next, hold down the Option key. Now Drag the selected object. A copy will remain behind.

STRAIGHT AS AN ARROW. Pressing Shift Option while in MacPaint forces drawing to be vertical or horizontal. Rectangles become squares and ovals become circles.

CUSTOMIZED BORDERS. In MacPaint, holding down the Option key while drawing with rectangles, ovals, and other shapes results in their being drawn with a border that matches the currently selected pattern.

FANCY QUOTES. The following quote symbol " can be obtained by holding down the Option key and pressing [. Hold down Shift Option to get " (the other double quote). To obtain a single quote, press Option and], or Shift Option and] (for the ').

MATH SYMBOLS. If you want an unequal sign (≠) then try Option =. If you press Shift Option = you will get the ± symbol.

BULLETS. If you use a lot of • when you are typing lists, you can get them by typing Option 8.

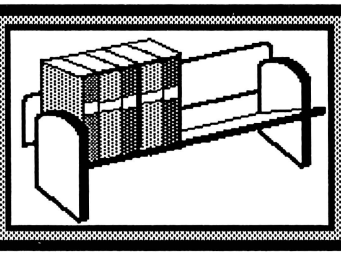
FONT/DA MOVER. Holding down the Option key while launching the Font/DA Mover forces this application to begin with a list of desk accessories instead of a list of fonts.

DA INFORMATION. While you are using the FONT/DA MOVER and are about to select a desk accessory, hold down the Option key. You will be informed as to how many characters (bytes) of memory have been used up by "code" and "pictures" within that desk accessory.

SEE IT ALL. While using the FONT/DA MOVER, hold down the Option key when you select OPEN. All files on that disk will be displayed. By doing this, you can more easily copy accessories and fonts and have them "travel" with your files to another disk. This is a good way of sending along a font with your document (a font that another user may not have).

4-WAY CURSOR. In MacTerminal, holding down the Option key transforms the cursor into a four-way VT100 arrow cursor. Move it where you want and click.

QUICK TRASH. You can more quickly trash an item that is locked or in use by holding down the Option key while dragging that item into the Trash can.



Resources

Publications

MacBriefs
P.O. Box 2178
Huntington Beach, CA 92647
(714) 842-0518

Macintosh Books

PASCAL

The Magic of Macintosh
Graphics & Sound in PASCAL
Bill Twitty
Scott, Foresman and Company
416 pages, $19.95

Learning Macintosh PASCAL
A Guide for Programmers
J. Wikert & S. Davis
Scott, Foresman and Company
356 pages, $19.95

PROGRAMMING

Assembly Language Primer for Macintosh
Keith Mathews
The Waite Group
412 pages, $24.95

Mastering the Macintosh Toolbox
D. Peabody
McGraw-Hill Book Company
200 pages

Using the Macintosh Toolbox with C
Takasuka, Huxham, and Burnard
Sybex Books
559 pages

Programming in C on the Macintosh
Terry A. Ward
Scott, Foresman and Company
411 pages, $21.95

Programming the Macintosh
An Advanced Guide
William Twitty
Scott, Foresman and Company
374 pages, $19.95

GENERAL MACINTOSH

MAC AT WORK
S. Venit and D. Burns
Wiley Press, NY
228 pages, $17.95

MacGuide the Complete Handbook for Macintosh
Leslie Smith
New American Library
277 pages, $14.95

MAC POWER
Allen Munro
Scott, Foresman and Company
320 pages, $15.95

Personal Financial Planning with The Home Accountant
Steve Adams
Arrays, Inc.
818-901-8828, 800-468-9222
248 pages, 17.95

BASIC

Macintosh Graphics and Sound
David Kater
Osborne/McGraw-Hill
276 pages

Macintosh Midnight Madness
(Utilities & Games in BASIC)
The Waite Group
Microsoft Press
420 pages, $18.95

Microsoft BASIC Programming for the Mac
Sharon Zardetto Aker
Scott, Foresman and Company
344 pages, $17.95

Short, Simple, and BASIC
Business Programs for the Macintosh
M. Robinson and T. Kepner
Scott, Foresman and Company
320 pages, $18.95

GRAPHICS, ART, WORD PROCESSING

The MAC Art Department
Tom Christopher
Simon & Schuster, NY
96 pages, disk, $39.95

The Printed WORD
David Kater & Richard Kater
Microsoft Press
Bellevue, WA
293 pages, $17.95
Review: MACAZINE, Vol.3, No.2, p. 36

Graphics for the Macintosh
An Idea Book
J. Grillo and D. Robertson
CBS Computer Books
Holt, Rinehart, and Winston
217 pages, $17.95

MacGraphics for Business
Jerry Mar
Scott, Foresman and Company
194 pages, $17.95

MacCats : 99 Ways to Paint A Cat with MacPaint
Floyd Flanagan
Scott, Foresman and Company
146 pages, $9.95

SPREADSHEETS

Multiplan Mastery on the Macintosh
Andrew J. Townsend
Scott, Foresman and Company
260 pages, $18.95

Doug Clapps JAZZ Book
Doug Clapp
Scott, Foresman and Company
272 pages, $17.95

Hands-on EXCEL
Danny Goodman
Scott, Foresman and Company
328 pages, $21.95

Making Your Macintosh EXCEL
Bill O'Brien
Scott, Foresman and Company
356 pages, $19.95

Articles of Interest

GRAPHICS

Working with Clipboard, Scrapbook, Notepad
MACUSER
Mar. 86 p. 91

MacDraft vs. MacDraw
MACAZINE
Vol.3, No.1 p. 97

Cutting, Pasting, Using Graphics
MACWORLD
Jan. 86, p. 68

HARDWARE

Making the Hardware Connection
A+
Jan. 86 p. 30

LaserWriter Revealed
MACUSER
Feb. 86 p. 55

Optical Disks
MACWORLD
Feb. 86 p. 100, 109

Memory Upgrades
MACWORLD
Feb. 86, p. 114

Printing in Color
MACWORLD
Jan. 86, p. 113

SOFTWARE

It's Tax Time
MACUSER
Jan. 86 p. 45

BASIC -Looking at ROM
MACUSER
Jan. 86 p. 105

BASIC - A Dip into the ROM
(Provides a pattern utility)
MACUSER
Dec. 85 p. 103

Which Programming Language
MACUSER
Jan. 86 p. 110

Desk Accessories
MACUSER
Dec. 85 p. 46

MIDI to the Macs Music
MACUSER
Dec. 85 p. 91

A Comparison of Communications Packages
MACAZINE
Vol. 2, No. 12

BASIC and the ImageWriter
MACUSER
Feb. 86 p. 97

Macintosh Data Transfer
A+
Jan. 86 p. 52

Function Keys
(A Program)
MACUSER
Feb. 86 p. 105

Mac in the Newsroom
A+
Mar. 86 p. 119

Managing Your Disks
MACWORLD
March 86, p. 80

Taking Care of Taxes
MACWORLD
March 86, p. 87

Electronic Media (HyperText)
MACWORLD
March 86, p. 116

Expert Systems
MACWORLD
Feb. 86, p. 29

Project Reports

This section of ***Wheels for the Mind*** presents many of the projects that are being developed at various colleges and universities. The listings are not restricted to Consortium schools or to schools in this country. You will find projects that are being done at universities all over the world. Project listings that appeared in the previous issue appear here in an abbreviated form; new listings are described in more detail (when available).

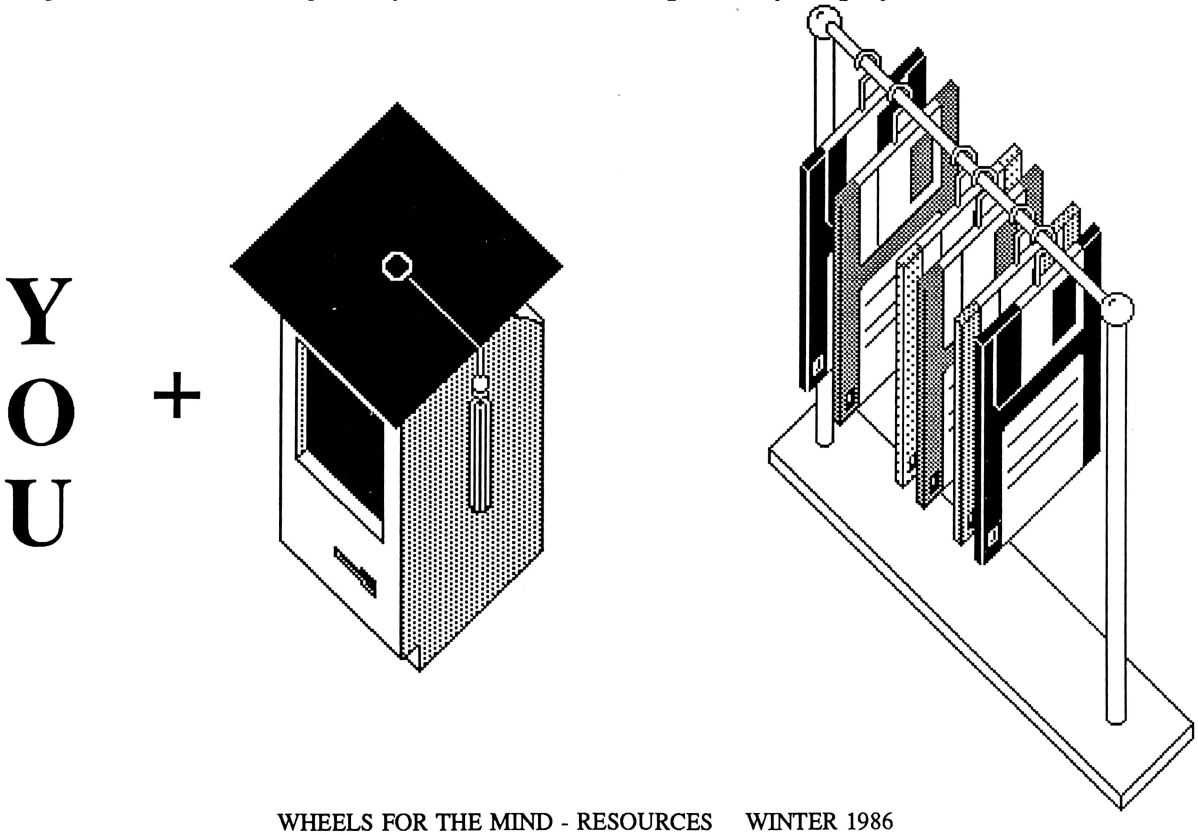
Some of the items listed here are just in the beginning stages while others are completed and ready for distribution.

Wherever possible, we have tried to list an appropriate contact in case you are interested in finding out more about a particular listing.

One of the original intents of organizing educational institutions around the Macintosh was to provide opportunities for creative people to share their expertise and talents. We are sure that you will find much of that creativity in evidence here.

Please feel free to collaborate on developing an application, develop one on your own, or simply use one that was developed by one of your colleagues.

Most important, let us know what YOU are working on. Perhaps there are others across the world that might like to be working with you! Send us a description of your project.



[redacted]

Project: Instrument Panel

Robert Loewenstein of Yerkes Observatory is developing a remote control "instrument panel," written on a Macintosh 512K in a beta release of Kriya Systems' Neon, for use with a new 3.5-meter telescope to be built in New Mexico. For further information, see the winter 1986 issue of *Wheels for the Mind.*

Current status: Running and under continued development.

Contact: Robert Lowenstein, Sr. Research Associate, Dept. of Astronomy and Astrophysics, Yerkes Observatory, P. O. Box 0258, Williams Bay, Wisconsin 53191; (414) 236-5468

Project: Spaceflight Instrument Data Collection

The Laboratory for Astrophysics and Space Research is using a Lisa computer to perform bench tests, accelerator calibration, and eventually, data collection from spaceflight instruments that measure cosmic rays.

Current status: In use.

Contact: William Sterner, Lead Staff Analyst, Information Technologies and New Services Computation Center, University of Chicago, 5737 University Ave., Chicago, IL 60637; (312) 962-7172 STAFF.BILL@UCHICAGO

BIOLOGY

Project: Botanical Classification

A plant identification program to enable students to identify any one of 90 different shrubs and trees in the local environment. **Identifies all flora native to immediate area around Drexel University.**

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Identifying Biological Specimens

AUTOKEY is an interactive system (written in Absoft's FORTRAN) that is designed to provide quick and accurate identifications of biological specimens for people with little direct experience in biological identification.

Current status: Complete.

Contact: Dr. Ron Hellenthal, Dept. of Biology, University of Notre Dame, Notre Dame, IN 46556

Biology

Project: Evaluation of Natural Habitats

ERAPT is an interactive information retrieval and analysis system that permits the evaluation of natural habitats and organism assemblages using stored information on the environmental requirements and pollution tolerances of biological species.

Current status: A prototype version of this system is currently running on a Macintosh 512K. A full implementation of the system on the Macintosh XL is planned.

Contact: Dr. Ron Hellenthal, Dept. of Biology, University of Notre Dame, Notre Dame, IN 46556

Project: Labtutor

Labtutor (Lisa Pascal) is a package that uses its own command interpreter to process procedure files into interactive laboratory tutorials that present complicated analytical procedures as simple step-by-step instruction sets.

Current status: This system is still in an early development phase and is not expected to be completed **until Sept. 1986.**

Contact: Dr. Ron Hellenthal, Dept. of Biology, University of Notre Dame, Notre Dame, IN 46556

Project: DNA Analysis

The Cornell DNA analysis package, which allows the user to perform various types of pattern-matching analyses on strings of DNA and RNA, has been adapted to the Macintosh.

Current status: Complete.

Contact: Craig McGowan, Computer Center, University of Rochester, 727 Elmwood Avenue, Rochester, NY 14620

Project: Heat Exchange in Animals

This program consists of instructional and interactive material on the physical laws governing heat transfer and the thermoregulatory strategies adopted by animals.

Current status: Near completion.

Contact: Professor Craig Heller, Department of Biological Sciences, Stanford University, Stanford, CA 94305

CHEMISTRY

Project: Molecular Editor/Compiler

A software-based molecular-model construction kit that allows molecules or crystal structures of up to 99 atoms to be displayed in a three-dimensional ball-and-stick representation and rotated about any of three axes.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Prelabs
A series of programs that enable students to test their understanding of concepts and procedures they will be using in their **laboratory sessions,** written with the Lesson-Writer authoring tool.

Current status: **Ongoing.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Orbital Mixing
Orbital Mixing depicts the molecular orbitals derived from the 1p orbitals overlapping the PI manner.

Current status: Finished and being used in intermediate-level chemistry courses.

Contact: The Personal Computing Center, 1 McNutt Hall, Dartmouth College, Hanover, NH 03755; (603) 646-3249

Project: Controller for Laboratory Equipment

A data-acquisition program for the EMM-2048 or Universal Microcontroller that sets up the communication protocol necessary to access digitized data collected from laboratory experiments.

Current status: Unknown.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: R/S
R/S illustrates the Cahn-Ingold-Prelog stereochemical designation system; presents the correct designation procedure for molecules with one chiral center, using static text and four interactive examples; and presents nine interactive problems of increasing complexity.

Chemistry

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: PeriChart

A data base of atoms and elements that uses the periodic chart as a control structure, allowing the user to obtain data for such properties as isotopic masses and abundances, electronegativities, oxidation states, and valence electron configurations.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Quantum Chemistry

(1) Particle in one-dimensional box with finite wall.
(2) Simple Huckel molecular orbital.
(3) Ab initio self-consistent field molecular orbital plus configuration interaction.
These are all being cleaned up for easy access by the novice user.

Current status: Used (1) in freshman honors chemistry, (2) with junior physical chemistry students, and (3) with seniors and graduate students. (Absoft's FORTRAN).

Contact: Dr. Maurice E. Schwartz, Department of Chemistry, University of Notre Dame, Notre Dame, IN; (219) 239-7744

Project: Multiplan Spreadsheets

EquilCalc provides a tool for solving equilibrium concentrations in the general reaction aA+bB=rR+sS, given initial concentrations and the equilibrium constant. AcidBaseTitr generates a plot (within Multiplan) of pH vs. added base for the titration of a weak acid with a strong base; no approximations as to the magnitude of Ka or [H+] are made in deriving the equation used in AcidBaseTitr. Molmass is a simple molecular weight and percent composition calculator.

Current status: Expected completion **May 1986.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Reaction Rates

A simulation in chemical kinetics that computes time-dependent concentrations of a chemical reaction after initial concentrations of reactants and temperature are specified.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Chemistry

Project: Vistas in Chemistry (MacVIC)

The goal is to develop highly visual, animated graphics that illustrate chemical and physical phenomena; suitable for first-year courses.

Current status: Probable completion by summer 1986.

Contact: Dr. Russ Larsen, Department of Chemistry, Texas Tech University, Lubbock, TX 79409; (806) 742-3057

Project: Organic Molecular Structures

This project will explore the feasibility of using the Macintosh to generate complex organic molecular structure to aid in teaching organic chemistry.

Current status: Completed.

Contact: Roy Roberts, Chemistry, College of Natural Sciences, University of Texas, Austin, TX 78712

Project: BenchTop Application: NMR Spectroscopy
NMRSystem, developed by Adam Whiting, a chemistry senior at Reed College, allows a Macintosh to run, display, and store NMR spectra from a Varian EM-360 NMR Spectrometer.

Current status: Completed.

Contact: Marianne Colgrove , Education and Documentation Coordinator, Development Lab, Reed College, Portland, OR 97202; (503) 771-1112 ext. 277

Project: Molecular Weight Calculator

A desk accessory for computing the molecular weight of an entered formula. Both the formula and the molecular weight can be copied, cut, and pasted into other applications or into the standard calculator desk accessory. The molecular weight is based on atomic masses accepted as standard reference data.

Current status: Completed.

Contact: Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104

Project: 3D Protein Structures

This program utilizes the x-ray crystallographic coordinates of a protein to generate 3D images of the protein's structure. The actual picture drawn is based on a series of simple commands such as TRACE, BACKBONE, and SIDECHAIN to specify the portion of the structure to be shown on the screen. The image can be viewed either in mono mode or as a stereo pair. The portion of the structure displayed on the screen can be rotated about the x, y, and z axes individually or simultaneously.

Current status: To be completed by summer 1986.

Chemistry

Contact: Evan R. Kantrowitz, Department of Chemistry, Boston College, Chestnut Hill, MA 02167

Project: Huckel Molecular Orbital Theory

Simple Huckel Molecular Orbital (HMO) calculations can now be done using the programs NDChemHMO. These perform HMO calculations in a straightforward way suitable for student use. A conventional sequence of "bonds" (connections) is automatically generated; new bonds can then be added by the user, or undesired bonds removed. Atomic/bond integral paramenters (the coulomb, or alpha; and the resonance, or beta) are first set at standard values; the user may change them as desired to introduce "heteratoms." Various options are provided for computation of energies, charge/bond orders, and other calculations, and for displaying/saving results. The programs provide examples in honors/advanced first-year chemistry. Physical chemistry students use them to do their own HMO calculations.

Current status: Working programs are now being used/distributed; small changes are made as user experience grows.

Contact: Dr. Maurice E. Schartz, Department of Chemistry, University of Notre Dame, Notre Dame, IN 46556; (219) 239-7744

Project: Chemical Curve Fitting

Fitting raw or converted data to other raw or converted data is commonplace in chemistry and other science/engineering disciplines. We can now perform least-squares analyses up to 10th-degree polynominals using NDChemFit /Draw. The programs provide a variety of useful features, such as data error checking/correction; data-set modification (addition, deletion, switching); successive, different analyses of the same data; conversion of "raw" to "analyzable" data with additive/ scaling transformations; conversion of data through mathematical transformations (logarithmic, powers, and others); graphic display of raw data, transformed data, and results of fitting; saving of numerical and graphical results. The programs are routinely used in honors/advanced first-year chemistry and in physical chemistry, and are spread about the campus in various uses.

Current status: Working programs are being distributed; small changes are made as user experience grows.

Contact : Dr. Maurice E. Schartz, Department of Chemistry, University of Notre Dame, Notre

Dame, IN 46556; (219) 239-7744

Project: Periodic Table Tool

Periodic Table Tool utilizes the periodic table to organize chemical information, and displays this data in tabular and graphical form. It allows a periodic table to be designed by simply dragging elements to the desired position on the desktop of this application. A maximum of ten different tables may be created, and each is displayed via menu options. Users can declare attributes (electronegativity, atomic weight, covalent radius), and enter data for individual elements. The data for all the attributes may be shown for an element using a periodic table. This information may be alternatively listed in tabular form for all elements. Characteristic sets of elements, such as transition metals, noble gases, and nonmetals, may also be specified. Users can search for elements matching selection criterion (such as all metals having a covalent radius greater than 1.30Å);matching elements are highlighted when located. Scatter plots are constructed on an X/Y graph using any pair of numeric attributes, and if atomic number is the X coordinate, points may be connected by lines. Graphs and tables may be saved as pictures, and easily accessed for display within the application. A disk cache may be used with Periodic Table Tool, and the size of the data file (table forms, attributes, sets) is limited only by the available space on disk. (Megamax C).

Current status: Expected completion May 1986.

Contact: James F. Johnson, Assistant to Chairman, Department of Chemistry, 247 Nieuwland Science Hall, University of Notre Dame, Notre Dame, IN 46556; (219) 239-5659

Project: Reaction Formatter

A desktop accessory that may be used with MacWrite, Reaction Formatter addresses the problem of formatting formulas in chemical reactions. As the chemical equations are entered, superscripting and subscripting are performed automatically and displayed immediately. Alternatively, this formatting may be completed manually. A preference box allows the user to change the point size of super/subscripts. Selected characters from the Symbol font are accessed using the mouse, and can be included in the reaction at the cursor location. The chemical information within the accessory's edit box, which includes a horizontal scroll bar, may be copied to the Clipboard. The Clipboard can accumulate several reactions, and may be displayed at any time. This collection of formatted chemical information can be pasted into a MacWrite document or saved as a separate document. (Megamax C).

Current status: Expected completion spring 1986.

Contact: James F. Johnson, Assistant to Chairman, Department of Chemistry, 247 Nieuwland Science Hall, University of Notre Dame, Notre Dame, IN 46556; (219) 239-5659

COMPUTER SCIENCE

Project: An Assembly-Language Shell

The "Supervisor" provides an assembly-language environment in which the programmer can concentrate on programming with the 68000 assembly language, without worrying about input and output or even about the fact that the programming takes place on a Macintosh. [It was described in more detail in Issue #2 of *Wheels for the Mind* in March 1985.] To obtain the software, please send a request (on official academic stationery), a blank disk, and a SASE with sufficient return postage.

Current status: Completed.

Contact: Professor Jerry Keough, Department of Mathematics, Boston College, Chestnut Hill, MA 02167

Australian Computer Science Projects

Project: Micro-Based Board for AppleTalk-to-UNIX ACSnet Link

Contact: Dr. Mike J. Rees, Information Science, University of Tasmania

Project: Macintosh Electronic Blackboard

Contact: Dr. Mike J. Rees, Information Science, University of Tasmania

Project: Digitizing Software for the Macintosh

Contact: Department of Information Science, University of Tasmania

Project: MacShell—Sophisticated Terminal to UNIX

Contact: Steve Coy, Computer Science, University of Western Australia

Project: MacProlog—Ported from PDP11 UNIX

Contact: Steve Coy, Computer Science, University of Western Australia

Project: Compiler/Interpreter for Pascal-S

Contact: Neil Gray, Computing Science, University of Wollongong

Computer Science

Project: Distributed Programming

Contact: Neil Gray, Computing Science, University of Wollongong

Project: Small Laboratory Computer Simulation

Contact: Neil Gray, Computing Science, University of Wollongong

Project: MacEngine

Cut-down Macintosh for use in such applications as sharing printers, print spooling, and providing a network gateway.

Contacts: Neil Gray and Gary Kelly, Computing Science, University of Wollongong.

Current status: All projects are continuing.

Project: Rascal

Rascal is a new Pascal-based language-and-development system designed for the Macintosh, incorporating Editor, Linker, Compiler, and Execution Environment in a single application.

Current status: Totally complete! Commercially available for $129 (discounts for educational users), from Metaresearch, Inc., 1100 SE Woodward, Portland, OR 97202; (503) 232-1712

Technical contact: Scott Gillespie or Richard Crandall, Reed College, Portland, OR 97202; (503) 771-1112 ext. 277

Project: Assembler/Editor/Loader

This application was designed to allow efficient programming of Intel 8051/8031/8751 microcontrollers. Using the Macintosh window environment, this package provides instant visual access to all steps of program development. It is ideal for programming serially networked MCS-51-based devices or for high-speed data collection and appliance control via external lab computers.

Current status: Completed. Price: $150.

Contact: Richard Crandall, Reed College, Portland, OR 97202; (503) 771-1112 ext. 277

Project: Pascal Pointers

A tutorial-type package for teaching the use of dynamic variables and pointers in Pascal.

Current status: Completed.

Computer Science

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: LR1 Gen

A Parser/Generator. This program accepts an input grammar and generates LR-Parse tables from the grammar. Options: LR, LALR, Strong Compatible LR, Weak Compatible. LR-Parse tables in human-readable and machine-readable forms.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: UNIX-Based C-Development System

SUMacC is the Stanford/UNIX Macintosh C-development environment, a collection of programs that allows you to cross-develop Macintosh applications on your UNIX system and then download them to the Macintosh for execution. Requires VAX, Berkeley UNIX, or Eunice. A tape containing the SUMacC files is available for $65 plus shipping.

Current status: Version 2 completed.

Contact: Maria Code, Data Processing Services, 1371 Sydney Drive, Sunnyvale, CA 94087; (408) 735-8006

Project: Using Pascal in Introductory Programming

The computer science department has already added a Macintosh section to its CS1 "Using Computers" course.

Current status: Ongoing.

Contact: Asst. Chairman, Undergraduate Education, Stanford University; (415) 497-2300

Project: Using the Macintosh in a First Computer Course

The Macintosh has been successfully used as the primary learning tool in a first computer course for about 400 students.

Current status: Completed and continuing.

Contact: James Gips, Computer Sciences, Boston College, Chestnut Hill, MA 02167

Computer Science

Project: MacGnome

MacGnome is a Macintosh environment for teaching beginning programming.

Current status: Beta test.

Contact: Rob Chandhok, Carnegie Mellon University, (412) 268-3452

Project: MacProlog

An implementation of Prolog for the Macintosh ported from a PDP11 UNIX version. Version 1 is a straight port with a single, unsizable window. Version 2 will have multiple windows and control menus. Version 1 is available to Consortium members free of charge. Send us a disk.

Current status: V1 is completed and V2 will be ready in early 1986.

Contacts: Casper A. Boon and Damian P. Meyer, Department of Computer Science, University of Western Australia, Stirling Highway, Nedlands 6009, Western Australia, Australia; (09) 380-2282

Project: Binary Trees

Binary Trees is used in computer science courses to allow students to experiment interactively with the concept of binary trees.

Current status: Now in Version 2.1.

Contact: The Personal Computing Center, 1 McNutt Hall, Dartmouth College, Hanover, NH 03755

Project: Event Tutor

Event Tutor helps Macintosh programmers learn about "events" (see *Inside Macintosh*, "The Event Manager").

Current status: Version 1.1 available.

Contact: The Personal Computing Center, 1 McNutt Hall, Dartmouth College, Hanover, NH 03755

Computer Science

Project: Structure Charts for the Macintosh

We are developing a computer-aided design program on the Macintosh to assist with the preparation of structure charts in both business and computer science applications. The structure charts use the standard conventions presented in *The Practical Guide to Structured System Design* by Meilir Page-Jones. Easily modified, the charts will be especially convenient in a prototyping environment. The program, with automatic layout (while allowing the user liberal control), will create attractive laser-printer output, suitable for presentations or publication.

Current status: Under development. Completion expected in spring 1986.

Contact: Andrew James Peterson, Student Programmer, Computing Center, University of Oregon, Eugene, OR 97403-1212; (503) 686-4394

Project: Systems Analysis

This is an interactive, menu-driven software package using MS BASIC for systems analysis. It can be used as an aid in solving problems that involve matrix manipulations. Includes the ability to find roots of a set of nonlinear equations using the Newton-Raphson method, an ordinary differential equation solver, some graphic routines in order to animate the time-response of dynamic systems, and finite element techniques.

Current status: Completed.

Contact: Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104

DESIGN

Project: 3D Geometry

Mechanical engineering Professor Douglass Wilde's program allows manipulation of computer-generated pictures as part of instruction in three-dimensional computer-aided design.

Current status: Completion expected in early 1986.

Contact: Mike Barlow or Karen Lee, IRIS, Cypress Hall, Stanford University, Stanford, CA 94305

Project: PADL 1—Computer-Aided Design

PADL 1 is a solid-modeling program currently running on VAX computers.

Current status: **Half completed.**

Contact: Rich Marisa, University of Rochester, 727 Elmwood Avenue, Rochester, NY 14620

Project: Perspective Drawing Recognition.

The School of Design and Environmental Analysis is developing a teaching program for recognizing correct perspective drawing.

Current status: Completion expected in April 1986.

Contact: Kate MacGregor, Cornell University

Project: Energy Diagramming

The Department of Architecture at the University of Oregon is developing a program that will aid architecture students in learning how to incorporate energy considerations in the earliest phases of the design process. Frequently, these considerations, such as siting and orienting a building to take maximum advantage of solar energy, are neglected in schematic design because they are considered "too technical" to worry about early on. But by the time a student has completed a schematic design and is ready to do calculations on it, it is too late to make fundamental changes such as siting and orienting that are all-important in energy performance.

This program allows the user to sketch a building to any desired level of detail in a MacPaint-like environment, and then do area "take-offs" in a MacDraw-like environment. The program does the calculations, and provides a large data base of defaults for information not given by the user. Thus the user can very quickly determine approximate performances and make preliminary decisions about a design idea. Besides energy evaluations, the program includes tutorial "labs" on several technical topics such as sun movement and thermodynamics; a library of historical examples for

inspiration; and a predesign analysis to help the user understand the special problems posed by a particular building type in a particular climate.

The program is being written in C for a Macintosh 512K with external drive. The project is funded by the Fund for the Improvement of Post-Secondary Education, U.S. Department of Education.

Current status: Completion of a working prototype is scheduled for September 1986. Final completion is scheduled for September 1987.

Contact: G.Z. Brown or Barbara-Jo Novitski, Department of Architecture, University of Oregon, Eugene, Oregon 97403; (503) 686-5647

Problem Sets for Introductory Economics

Covers topics ranging from supply and demand to international trade. Students receive problem sheets for which instructor assigns random values (within set parameters) for all variables. Professor has disk that generates **variable-values answers for problems using these variables** . Requires Multiplan.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Problems in Macro- and Microeconomics

A five-disk set that includes microeconomics—introduction, cost functions, demand, competitive models, and wages (pure competition, imperfect competition, monopsony, and union), macroeconomics—money and banking, international exchange and trade, economic objectives, income determination, and fiscal policy—and an economic data base. Requires Multiplan and MacWrite.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

EDUCATION

Project: MacSED—Software-Evaluation Data Base for Macintosh

Current status: To be completed in spring 1986.

Contact: Prof. Michael Scriven, Education, University of Western Australia

Education

Project: Mentor

This project will use Odesta Helix, and possibly other software, to provide a question-answering, CAL, and testing data base for teachers.

Current status: To be completed in November 1986.

Contact: Prof. Michael Scriven, Education, University of Western Australia, Stirling Highway, Nedlands 6009, Western Australia

Project: An Examination-Answering Program

This application is being developed for use by first-year computer science students; it will be part of an automatic examination-generation, answering, and marking system.

Current status: Completed.

Contact: Ranadeva Peries, Department of Computer Science, University of Western Australia, Stirling Highway, Nedlands 6009, Western Australia

Project: Child's Math Practice Games

Current status: Ongoing.

Contact: Dr. I. Robertson, Geology, Australian National University

Project: Multiple-Choice Test Scoring Program

Current status: Unknown.

Contact: Brian Anderson, RUUE, University of Western Australia

Project: Game Tests for Children

This application contains a series of very simple games, written so the child does not get beaten as quickly as in other computer games.

Current status: Unknown.

Contact: Monique McGuire, Department of Computer Science, University of Western Australia, Stirling Highway, Nedlands 6009, Western Australia

Education

Project: The Show and Tell Language

The Show and Tell Language (STL) is a new visual programming language designed for schoolchildren and novice computer users.

Current status: Beta test in May; copy and user manual available for $10.

Contact: Don Kimura, Ph.D., Dept. of Computer Science, Washington University, 509 Bryan Hall, St. Louis, MO 63130; **(314) 889-6122**

Project: MatchMaker

This application is an authoring tool that enables the user to create matching exercises for drill and practice or testing. Any character that can be typed in MacWrite and then saved as text can be included in the application.

Current status: Unknown.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Faculty Developer's Agreement

The University of Chicago Computation Center released a standard "Developer's Agreement" for faculty, staff, and students that provides the official framework for technical and administrative support of Macintosh software development on campus for the nominal fee of $150 per year.

Current status: Completed.

Contact: Computation Center, University of Chicago, 5737 University Ave., Chicago, IL 60637; (312) 962-7151, BITNET @UCHICAGO.

Project: Computer-Aided Learning of Euclidean Geometry

Current status: Unknown.

Contact: A. Koerbin, Information Science, University of Tasmania

Project: Multiple-Choice Examination System

Current Status: Unknown.

Contact: Department of Information Science, University of Tasmania

Project: Interactive Teaching Package

Current status: Unknown.

Contact: Department of Information Science, University of Tasmania

Education

Project: Faculty Handbook

This project involves a faculty handbook and disk activities for first-year college composition classes. Published by D.C. Heath. See the News and Notes section of the winter 1986 *Wheels for the Mind* for more detailed information.

Current status: Completed.

Contact: Stephen Marcus, School of Education, University of California, Santa Barbara, CA 93106; (805) 961-4422

Project: TECA (Test Elaboration, Correction, and Analysis)

TECA's purpose is to facilitate the elaboration, correction, and analysis of objective tests or proofs. It has three parts:

1. Form Maker: Its input is an ASCII file containing the test information, codes that describe the type of each test item, and the text of the answers (the correct ones and the distractors). It allows the following types of items: true/false, multiple choice, and elaboration. From this information onward, it elaborates as many different forms as we wish.

2. Correcter: Its input is an ASCII file containing an identifier for each subject who has completed the test along with that subject's answers (codes). Using stored information about these items, it corrects each test, giving the number of hits, errors, and omissions.

3. Statistical Analysis: TECA performs statistical analysis on the test results, offering a series of general statistics (frequency distribution, mean variance, standard deviation, skewness, kurtosis, and reliability by means of Cronbach's alpha method). In addition, it offers a series of statistics about the different items (percentages of hits, errors, and omissions; Garret's difficulty index; variance; standard deviation; and item-total correlation).

The following features are being considered as future enhancements:

- An editor to introduce the test items.
- An editor to introduce the subjects' answers to the tests.
- Interchange of information with some data bases for storing the items and their statistics.
- Output of the functions compatible with other statistical programs.

Current status: The first version will be complete in April 1986.

Contacts: Jaime Sanmartin and Juan Carlos Ruiz, Departament de Psicologia Experimental, Facultat de Psicologia, Unversiat de Valencia, Avd. Blasco Ibanez 21, 46010 Valencia, Spain; (96) 369-4850

Education

Project: Anatomiser

A graphic authoring tool for teaching anatomy or any other subject with graphic content. Available for downloading on Delphi (ICONtact) or CompuServe (MACUS).

Current status: Completed.

Contact: Prof. Stephen Dubin, Dept. of Biomedical Engineering, Drexel University, Philadelphia, PA 19104

ENGINEERING

Project: Determinate and Indeterminate Structures

Analyzes simple determinate and indeterminate structures. Students can use this software to conduct parametric studies of the effect of relative stiffness, boundary conditions, and geometry on structure response.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Igneous Rock Identification

Uses basic properties of igneous rocks (mineralogy, color, texture, and so on) to assist in the identification of common igneous rocks. Properties determined in the laboratory are used as input.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Sedimentary Rock Identification

Employs basic properties of sedimentary rocks (mineralogy, grain size, fossils, and so on) to assist in the identification of common sedimentary rocks. Properties determined in the laboratory serve as input.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Metamorphic Rock Identification

Employs basic properties of metamorphic rocks (mineralogy, texture, and so on) to assist in the identification of common metamorphic rocks. Properties determined in the laboratory serve as input.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Earthquake Engineering

Reviews and defines basic principles of earthquake seismology through text and graphic displays. A short review of selected applications of seismology is included.

Engineering

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Structural Geology

Reviews basic principles of structural geology and applies those principles to the interpretation of geologic maps.

Current status: Completion expected.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Groundwater Hydrology

Reviews and defines basic principles of groundwater hydrology and geology (including steady-rate well hydraulics).

Current status: Completion expected.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Material Balances

TK!Solver templates and Macintosh Pascal programs for use in teaching material balances.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Electromagnetics

Developed to aid classroom instruction of various aspects of electromagnetic field theory through the production of visual aids and exercises.

Current status: Completion expected in June 1986.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: TK!Solver for Problems in Materials Science and Engineering

Includes rapid crack propagation in plastic pipes, prediction of phase diagrams, determination of purity of materials, polymer flow and processing, and impact behavior of materials. All important behavior of materials properties (thermophysical, mechanical, electrical, chemical, and so on) is covered.

Engineering

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: SISO

An application for the study of linear dynamic systems and linear control theory. Includes simulations, designs, and graphic output. System is designed and analyzed in both time and frequency domains. **Eigenvalues, eigenvectors, frequency response, and root locus.**

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Fourier Analysis

Follows the same user-interaction format and screen-design philosophy as the Signal Operations module for undergraduate courses in systems engineering. Performs discrete Fourier Transform of signals using the Fast Fourier Transform (FFT) algorithm and allows a variety of signal operations in both the time and frequency domains.

Current status: **Complete.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Geotechnical Engineering I

A civil engineering application that provides laboratory reduction programs (consolidation, triaxial shear, and so forth) and related graphics.

Current status: **Completed.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Geotechnical Engineering II

This project includes geotechnical engineering analysis programs (consolidation settlements, slope stability, pile analysis, and others) and related graphics.

Current status: **Completed.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Engineering

Project: Mineral Identification

Employs a decision-tree type of approach to assist in the identification of 48 common minerals. Physical properties (hardness, color, cleavage, and so on) are determined by laboratory methods and used as input.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Mineral Analysis

This Pascal program assists students in identifying the 30 most common minerals found in rocks, soils, and important ore deposits, using basic physical properties, such as luster, cleavage, crystal symmetry, hardness, streak or color, and acid reaction.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Structural Analysis

Dialog programs for structural analysis to help students strengthen their background in basic principles of structural mechanics, including stability, determinacy, and equilibrium.

Current status: **Completed.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Structural Response to Loading

Interactive programs to determine structural response to loading. Can be used to conduct parametric studies of the effect of different parameters on structural response.

Current status: Unknown.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Simulation Design

Professor Jucker of the Department of Industrial Engineering has designed graphical exercises for analyzing random-number generators.

Contact: Mike Barlow or Karen Lee, IRIS, Cypress Hall, Stanford University, Stanford, CA 94305

Engineering

Project: Signal Operation

For use in introductory systems engineering courses, this module offers a variety of signal-generation options ranging from singularity functions, sinusoids, and exponentials to arbitrary functions.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Deformation and Fracture of Materials

Professor Miller of Materials Science is developing a program to model deformation and fracturing of materials under a variety of conditions.

Current status: Unknown.

Contact: Mike Barlow or Karen Lee, IRIS, Cypress Hall, Stanford University, Stanford, CA 94305

Project: Mechanics

Use of the Macintosh to produce orthographic, isometric, oblique, and section drawings; plots of graphs; and equation analysis of curves.

Current status: Unknown.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Systems Analysis

An interactive, menu-driven software package that uses MS BASIC. Can be used as an aid to solving problems in which matrix manipulations are involved.
Current status: Completed.

Contact: Doug Starfield, (317) 494-6256

Project: Thermal-Fluid Instructional Software

Thermal-fluid instructional software has been developed (on a VAX 11/750 computer using FORTRAN).

Current status: Unknown.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Engineering

Project: Introduction to the Thermosciences

The Rankine and Brayton Cycle session is a tutorial written for Engineering 32, Introduction to the Thermosciences by Professor Robert Eustis.

Current status: Unknown.

Contact: Mike Barlow or Karen Lee, IRIS, Cypress Hall, Stanford University, Stanford, CA 94305

Project: Water Microbiology and Organic Pollutants

Professor Grbic'-Galic' (Department of Civil Engineering) has devised a set of assignments that examines two processes: the growth of microorganisms and the degradation of organic compounds.

Current status: Unknown.

Contact: Mike Barlow or Karen Lee, IRIS, Cypress Hall, Stanford University, Stanford, CA 94305

Project: Bode Analysis Program

This program provides a magnitude and phase plot for a linear system with a rational transfer function.

Current status: Completed.

Contact: T. J. Wagner, Department of Electrical and Computer Engineering, University of Texas, Austin, TX 78712

Project: Transmission-Line Simulation

This program shows voltages and currents on a transmission line with real source and load impedances. This type of input, the length of the line, the attenuation, and the value of the source and load impedance may all be selected.

Current status: Completed/**ongoing**.

Contact: C.H. Roth, Department of Electrical and Computer Engineering, University of Texas, Austin, TX 78712

Project: Wave Guide Lab

The Mac488 interface was used to interface a multimeter to the Macintosh. MS/BASIC was used to control the experiment and graphically display the data acquired.

Current status: **Complete.**

Contact: John Lefor, Electrical Engineering, University of Rochester, 727 Elmwood Avenue, Rochester, NY 14620

Engineering

Project: Aerodynamics

This project will try to demonstrate that most computer programs in the computational fluid dynamics area can be successfully implemented on a Macintosh with two 400K disks, 512K RAM, and hard-copy computer graphics capability.

Current status: Completed.

Contact: George Dulikravich, **Penn State University**

Project: Desktop Laboratory

This program incorporates Macintosh systems for initial use in the Computer Applications in Chemical Engineering course, and will form the nucleus of a considerably larger number of applications in other chemical engineering courses.

Current status: Completed.

Contact: Eugene Wissler, Chemical Engineering, College of Engineering, University of Texas, Austin, TX 78712

Project: Graphics Course

A revised curriculum for a junior-level computer graphics course in the electrical and computer engineering department will be designed to incorporate the unique graphics capabilities of the Macintosh.

Current status: To be completed soon **(textbook ready in May).**

Contact: Terry Wagner, Electrical Engineering, College of Engineering, University of Texas, Austin, TX 78712

Project: Macintosh Use in Engineering Instruction

The University of Iowa College of Engineering has standardized on Macintosh computers. Every faculty member has a Macintosh on his or her desk. One student lab houses 40 Macintosh computers and another identical lab is currently being set up. In total, there are more than 160 Macintosh computers in use, along with ImageWriter and LaserWriter printers. As part of a three-year curriculum and computer integration plan, the computers are being used in teaching programming and engineering courses, working on projects—for every aspect of the engineering curriculum. More than 100 Macintosh computers are available for student use, either as stand-alone units or configured using University of Michigan-developed MacApollo software as an interface to the Apollo minicomputer for computer-aided-design (CAD) work. In a major software development effort, faculty members are responsible for software development in their curriculum areas. Additional commercial software such as Macintosh Pascal and public domain software developed at other universities has been adopted. Soon, each student will be expected to use the computer for a minimum of 10 hours per week.

Current status: Ongoing.

Contact: Dr. Jon Kuhl, Faculty Director, Iowa Computer Aided Engineering Network (ICAEN), University of Iowa, 2402 Engineering Building, Iowa City, IA 52242; (319) 353-7214

FONTS

Project: Boston College Font Project

A number of finished and tested fonts, with more available all the time.

Current status: Completed and ongoing.

Contact: Prof. M. J. Connolly, Dept. of Slavic and Eastern Languages, Boston College/Carney 236, Chestnut Hill, MA 02167: (617) 552-3912

Project: A Font Workshop

The Font Workshop, a disk prepared for the University of Washington, tries to clear up much of the confusion about using the Font Editor, Font Mover, and related tools. For a free copy, send a disk.

Current status: Completed.

Contact: Walter Knapp, 905 NE 114th, Seattle, WA 98125

Project: Signifier

Signifier features a remapped keyboard that provides additional diacritic keys to support the needs of Greek and Cyrillic.

Current status: Completed. Cost is $15 to AUC schools. **Send order to IRIS address.**
New version to be available in May.

Contact: Norm Meyrowitz or Bernard Haan, IRIS, Box 1946, Brown University, Providence, RI 02912

Project: Bengali Font

Current status: Unknown.

Contact: Dr. H. Hossain, Department of Environmental Planning, University of Melbourne

Project: Einstein Fontech

This is a general-purpose math and science font that comes in six sizes (9, 10, 12, 18, 20, and 24 point) and is designed to be used with disk-based MacWrite.

Current status: Completed. For a disk with installed font and instructions, please send $18.

Contact: Sciensoft, P.O. Box 6311, Lubbock, TX 79413; (806) 794-2833

Fonts

Project: Specialized Laser Fonts

A series of PostScript fonts–including Kadmos, Chemical Structure, Times and Helvetica Polish, and SmallCaps–for the LaserWriter printer is also under development and will be distributed commercially (prices not yet set).

Contact: Allotype Typographics, 1600 Packard Road, Suite 5, Ann Arbor, MI 48104

Project: Greek fonts

Alternate font development is also taking place on the University of Chicago campus. Perhaps the most complete Greek font package, SMK GreekKeys is commercially available for $25 in North America ($35 elsewhere). This package includes two different fonts in 9, 10, 12, 18, 20 and 24 points, a keyboard drive with 14 dead keys, and a MacTerminal document that displays both Greek and English that may be used with an on-line Greek data base: the Thesaurus Linguae Grecae.

Current status: Completed

Contact: SMK, 5760 S. Blackstone Avenue, Chicago, Il 60637; (312) 947-9157

Project: Alternate Font Development

Also at the University of Chicago, scholars at the Oriental Institute, Argonne National Laboratory, and various other departments have created specialized fonts including Khmer (with documentation, Prof. G. Diffloth, linguistics department), Arabic (12, with diacritics), Akkadian (with diacritics), Armenian, Bombay (12 and 24), Coptic (10 and 20), Cyrillic, Der (12 and 24), Demotic (20), Devanagari, Gaelic, Harmal (10), Hebrew (10), Latinica (10), Latvian (20), Moscow (12), Tamil, Vilne, and Yerkes (9), and an astronomical/scientific symbol font)

Current status: All listed fonts are completed.

Contact: William Sterner, Lead Staff Analyst, Information Technologies and New Services, Computation Center, University of Chicago, 1155 E. 60th Street, Chicago, IL 60637; (312) 962-7172, STAFF.BILL@UCHICAGO, A113

Project: Keyfont

This project displays fonts stored in FFIL files or different systems.

Current status: Complete.

Contact: C.F. Miller, Department of Mathematics, University of Melbourne

Project: ANUMath Font

Current status: Complete.

Contact: Neville Smythe, Department of Mathematics, Australian National University

Fonts

Project: Sanskrit and Thai Fonts (plus other Asian fonts)

Current status: Unknown.

Contacts: J. Radnell and P. Wesely-Smith, Department of Asian Studies, Australian National University

Project: Hupa Fonts

Hupa is a Hupa-language, Unifon-form character font for the Macintosh computer, available in seven point sizes: 9, 10, 12, and 14 points for documents, and 18 and 24 points for display or large-character documents.

Designed by Marc Cogan (Department of Humanities), Wayne State University, with Ruth Bennett (Bilingual Emphasis Program), Humboldt State University

Current status : Completed.

Contact: Dr. Ruth Bennett, Director Bilingual Emphasis Program, Center for Community Development, Humboldt State University, Graves Annex (No. 30), Arcata, CA 95521

Project: Asian Fonts

Southeast Asian Fonts—Inspired by the work of Gerard Diffloth (Chicago) on a Khmer (Cambodian) font and George Hart (Berkeley) on various Indian fonts, and building on work Grant Olson (Cornell) did on a font for Thai, I have been creating a variety of fonts for Southeast Asian alphabets. Most of them are 18-point fonts numbered as if they were 12-point fonts, so the actual consonants on the line are consistent with other 12-point fonts, but with much more space above and below the line to allow for complex superscripts and subscripts. In all my fonts, superscripts and subscripts are typed on dead keys after the consonant above or below which they display and print. To date, I have working versions of fonts for Thai, Burmese, Shan, and Lao; and am well on the way to completing a font for Javanese. Eventually, I will get around to doing Cham, Mon, and Northern Thai, and unless someone else does them, Black Tai and Tai Lu...and Ahom? Asian Studies Bibliography—The Association for Asian Studies is in the process of computerizing the compilation and printing of the annual Bibliography of Asian Studies. Compilation is done by area specialists in Michigan, Maryland, and Connecticut, and the final editing is done at Yale. We are using Macintosh computers equipped with HyperDrive hard-disk drives, and the Apple LaserWriter. Software being used is Microsoft FILE and WORD, and Aldus PageMaker. Richard Martin (Library, University of Virginia) is handling the hardware, and I am handling software. Compilation of the first volume is nearly complete, and publication is scheduled for late spring or early summer, following which we will be making a complete report. Among other things, we had to develop a special font that includes all the standard Library of Congress/OCLC diacritics with their standard ASCII mappings in the upper-128, so as to be compatible with downloaded bibliographical data bases to which we hope ultimately to gain access. Current status: Ongoing.

Contact: David Wyatt, Professor of Southeast Asian History, Cornell University, 415 Warren Road, Ithaca, NY 14850; (607) 257-1894 BITNET: T.RF4J@CRNL20A

GEOLOGY

Project: Magnetic Crystal Fractionation

Magnetic crystal fractionation processes will be modeled, using a program written in BASIC and the unique graphic capabilities of the Macintosh microcomputer. Input will include starting magma composition, composition and amounts of crystallizing minerals, and the number of crystallization steps. Output will include crystal cumulate and residual liquid compositions, and selected X/Y plots of particular chemical variables. The interactive character of the program will permit its use in class.

Current status: Completed.

Contact: Dr. Douglas R. Mason, Department of Geology, University of Newcastle, Ranklin Drive, Shortland, N.S.W. 2308, Australia

Project: Geology Simulation

The main idea of the simulation program is to move a fluid element through a basin and to calculate the processes of transport, deposition, and erosion in dependence on the fluid velocity at a certain section of the basin. Additionally, currents and the compaction of sediments can be simulated. There are a number of input parameters that control the system: initial fluid velocity, fluid volume, sediment input, grain-size distribution, physical properties of the sediment, and the initial basin configuration. The program is set up in modules and supports an extension to three dimensions. It offers a variety of possible experiments: simulation of growth faults, horst and graben structures, oscillating input parameters, randomly generated fluctuations of any input parameter, and more. The simulation also includes a number of sophisticated display programs. The simulated section can be displayed with its facies distribution, time lines, grain-size distribution, and layer display. Another graphics routine allows display of enlarged sections of particular parts of the simulated model. The program has been tested and it showed very realistic results, suggesting that this model can be used for sedimentation simulations.

Current Status: Completed.

Contact: Klaus Bitzer, Geologisches Landesamt, Albertstr.25, 78 Freiburg, West Germany

Project: Treaty of Versailles

A series of exercises to teach the major territorial and reparation decisions in the Treaty of Versailles. Uses questioning and interactive map exercises.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Historical Simulation: The Would-be Gentleman

A sophisticated simulation of economic and social life in 17th-century France, which casts the student as a nobleman. The aim is to maximize wealth and prestige over the two generations of the simulation.

Current status: Completed.

Contact: Prof. Carolyn Lougee, Stanford University, (415) 497-2300

HUMANITIES

Project: Tools for Writers

A text-analysis program that flags all uses of "to be" and occurrences of anomalous or incorrect words and phrases within a customized dictionary, among other things.

Current status: Completed.

Contact: **Prof. Eva Thury, Dept. of Humanities and Communication, Drexel University, Philadelphia, PA 19104**

Project: BRS Simulator

Software that simulates the search environment of BRS, a commercial data-base vendor, used to introduce freshmen to data-base concepts and search strategies before going on-line.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Humanities

Project: Create

A prewriting program designed to stimulate ideas about the direction a document should take to achieve its purpose. It is useful when students have chosen a topic but have not yet narrowed their focus.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Macintoshes in the Writing Program

Microcomputers are finding a place in the "Programs in Writing" at the University of Chicago. In fall, the Programs will institute a pilot project based on a cluster of 20 microcomputers chiefly intended for the use of first-year students in the humanities common core. Approximately a hundred students will be taught to use MacWrite, and will be expected to produce all of their essays for the humanities core on the cluster's machines. These students will be assisted by specially trained writing interns.

The purpose of the first year of the project is to determine whether word processing can make a substantial difference—beyond mere convenience—in how students learn to write. The students involved in the project will be given the kinds of instruction, assignments, and revision exercises that only word processing makes practical. Students selected for the project will be distributed randomly throughout the core, with the exception that one section of the core will have all 20 of its students involved.

The next step will be to develop ways to take advantage of the full power of the project's micros. The task for the second (and perhaps third) year will be to develop two kinds of software. The first is an integrated word-processing package that includes prewriting and editing utilities. Though such utilities are common enough, those now available have three major disadvantages: First, the utilities do not come as integrated packages; second, they are not based on adequate models of text structure and construction, failing to incorporate the vocabulary and analytical procedures widely shared by all the writing programs at the university; and third, they do too much of the students' work (a successful pedagogical utility is not one that tells students what to do to improve their work but one that leads students to do that work for themselves. The second kind of software we hope to find or develop is a communications package that makes two computers act as one, so that a student and an instructor can edit a text together. Beyond the third year of the project, the chief task will be to integrate the microcomputers that the students use with the UNIX-based minicomputer that will house the Programs' data bases of examples of student writing, exercises based on the student examples, exercises in basic grammar, and discipline-specific teaching handouts for students of varying skills.

Current status: Ongoing

Contact: Greg Colomb, University of Chicago, Programs in Writing, 5811 S. Ellis Ave., Chicago, IL 60637

Humanities

Project: Cave-Painting Data Base

In the 1960s, Indian cave paintings dating back to 8,000 B.C. were found in Texas. A typical approach to researching this art has rock art specialists sitting in caves observing the complex symbols to determine their meaning. At Rice University, the Department of Anthropology is using the Macintosh computer to create a data base of the paintings' attributes, details on the physical remains such as cactus cud and feathers, and locational information such as the paintings' distance from water and from the cave entrance. In addition to providing statistical analysis of the findings, photographs of the artwork are digitized and displayed on the Macintosh screen for closer inspection.

Future plans call for the computer to act as an artificial intelligence interface to provide pattern recognition. This means the computer will analyze the lines and offer an interpretation of the picture's subject. This project was exhibited from the end of January through the beginning of March at the campus museum. The exhibit included a Macintosh that offered viewers hands-on access to the data base. In November, the exhibit, including approximately 10 Macintosh computers, will move to Witte Museum in San Antonio, Texas.

Current status: Completed and ongoing.

Contact: Dr. Rod McIntosh or Patty Bass, Department of Anthropology, Rice University, 6100 Main Street, Houston, TX 77251; (713) 527-4003 or (713) 432-7892

Project: Computer Writing Lab

Instructors at this university are teaching journalism and writing in two unique computer lab settings. The College of Arts and Sciences has two networked classrooms complete with ImageWriter and LaserWriter printers. In one of the classrooms, students learn journalism skills using 24 Macintosh computers linked to a hard disk. In the other classroom, English professors provide hands-on intensive language instruction to 10 to 12 students using Macintosh computers linked to a hard disk. Faculty members use an additional 14 Macintosh computers. Instructors use the Macintosh and hard disk to give the students assignments. Then, with the click of the mouse, students call the assignment up on the screen, complete it and save it under a new file name. The instructor checks the work by opening up the student's file from the hard disk. This has been particularly useful for learning editing techniques. The instructor leaves the text to be edited and the student saves the completed assignment on the hard disk. Compositions are also graded on disk.

Current status: Ongoing.

Contact: Dr. Jeff Minter, College of Arts and Sciences, University of Hartford, 200 Bloomfield Avenue, West Hartford, CT 06117; (203) 243-4133

Humanities

Project: Writing Lab

This project explores the feasibility of using the Macintosh in a writing laboratory environment.

Current status: Completed.

Contact: Jerome Bump, College of Liberal Arts, University of Texas at Austin, Austin, TX 78712

Project: PROSE (Prompted Revision of Student Essays)

PROSE is designed to facilitate the process of writing instruction, and consists of two modules: one for the student and one for the instructor.

Current status: Expected to be completed in April 1986.

Contact: Kate MacGregor, Cornell University

Project: Computer Programming as a Liberal Art

Goal Statement: The goal of this course is to combine the techniques of computer programming with liberal arts modes of thinking about the human meaning and social applications of computers.

Course Description: The course will approach computer programming both as a specialized set of techniques tied to a particular subject matter, and as a set of interdisciplinary arts adaptable to a wide range of problems. Thus students will learn how to write programs in Pascal on Apple Macintosh computers, while at the same time learning how to reflect upon the activity of programming in more open-ended terms. Course assignments will include programming problems, several short quizzes, a midterm exam, and a paper. The course will be taught by William Sterner of the computation center and Don Crabb of computer science.

In specific, the course will present traditional techniques of problem solving, algorithm choice, program coding, and debugging through lectures and programming assignments—as does any introductory course. In addition, the course will examine these techniques as interdisciplinary arts of "recovery," "invention," "presentation," and "systematization."

Such arts acquired in the context of programming can then be generalized and adapted to other subjects. This additional part of the course will be approached through assigned readings, class discussion, and a "reflective" paper on the human meaning and social implications of computer programming.

Because of this wider context, the students must also learn to recognize those situations where even liberal programming arts are not adaptable to some problems. If such situations were assimilated to a "programming" approach, they might present potential dangers for society and might waste technological resources.

Prerequisites: Since the challenge of this course will lie in doing a lot of clear thinking in a humanistic mode, the student should have at least a rough sense of humanistic reflection. Previous coursework in the common core or philosophy would prove valuable. No prior programming experience will be assumed, and no mathematics beyond high school will be required.

Intended Students: This course is intended especially for liberal arts students who want to explore the meaning of computer technology, and for beginning computer science students who want to understand the broader significances of their discipline from the outset. Students with extensive programming or mathematical background should not register for this course.

Current status: New course to be offered summer 1986.

Contact: William Sterner, Lead Staff Analyst, University of Chicago Computation Center, 1155 E. 60th Street, Chicago, IL 60637, (312) 962-7172, STAFF.BILL@UCHICAGO, A113

LANGUAGES

Project: Macedonian-English Dictionary

Current status: Unknown.

Contact: Prof. R. De Bray, Department of Slavonic Languages, Australian National University

Project: Hypertext/Hypermedia

The Institute for Research in Information and Scholarship has undertaken a long-term research project to design and develop a hypertext-hypermedia system. The research is being conducted within the context of Brown's Scholar's Workstation Project—a decade-long effort directed at creating a campuswide network of high-powered, graphics-based workstations for use in research and teaching in the sciences and liberal arts.

Current status: A long-term, ongoing project. An initial hypertext/hypermedia prototype allows users to create links to interactive videodisc frames as well as text.

Contact: Norm Meyrowitz, IRIS Scholar's Workstation Group Manager, Brown University, Providence, RI

Project: Drill, an English-Language Drill Program

Drill can be used in almost any course where text- and/or picture-based drilling is useful. The disk includes Drill, (the program), Create a Drill (a script about writing drills), documentation, and sample drills.

Current status: Completed.

Contact: The Personal Computing Center, 1 McNutt Hall, Dartmouth College, Hanover, NH 03755; (603) 646-3249

Languages

Project: Russian Vocabulary
Prof. Van Campen has developed some drills in Russian vocabulary and morphology.

Current status: In progress.

Contact: Mike Barlow or Karen Lee, IRIS, Cypress Hall, Stanford University, Stanford, CA 94305

Project: The Glossarizer

The Glossarizer consists of a simple editor for entering text and a "glossary mode" for attaching notes, translations, or other explanatory information to a word or phrase in the original and was designed as a tool for foreign-language teaching.

Current status: Completed.

Contact: Katy McKinin, Rice University, ICSA, Box 1892, Houston, Texas; (713) 527-4986

Project: Spanish Language

The purpose of this program is to develop software programs designed to assist bilingual-education students to improve their written language skills in Spanish; to provide students with hardware and Spanish-language software in a laboratory setting; to gather data on the effectiveness of this type of computer-assisted instruction; revise the software accordingly; and to use the software for in-service training of current bilingual-education teachers.

Current status: **Expected to be completed in May 1986.**

Contact: George Blanco, Curriculum and Instruction, College of Education, University of Texas at Austin, Austin, TX 78712

Project: Demotic Dictionary

Dr. Jan Johnson of the University of Chicago Oriental Institute is using the Macintosh to produce a dictionary of the Demotic language. The dictionary staff has already compiled about 6 megabytes of material to be stored on a hard disk for easy access and analysis. Dr. Johnson plans to print the dictionary as a supplement to Erichsen's Demotisches Glossar on the LaserWriter, if the required fonts can be created for the device. If not, the dictionary will be printed on an ImageWriter and then offset.

Current status: Ongoing.

Contact: Jan Johnson, Director, Oriental Institute, 1155 E. 58th Street, Chicago, IL 60637

MANAGEMENT

Project: Data-Base Management Using Pascal Interpreter

Current status: Unknown.

Contact: W. Naughton and D. Whaiter, Department of Economics and History, Australian National University

Project: Geographic Informations Systems

Current status: Unknown.

Contact: Dr. I.D. Bishop, Department of Environmental Planning, University of Melbourne

Project: Prototyping of Iconic Interface for Accounting Packages

Current status: Preliminary.

Contact: J. Radnell and P. Wesely-Smith, Department of Commerce, Australian National University

Project: Key Financial Models

This project involves the programming of several key financial models, including a refunding model, lease vs. buy analysis, and a valuation model.

Current status: **Completed.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: HRPS

Conversion of Human Resource Planning Simulation from Prime system to Macintosh. HRPS is a classroom aid.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Assisted Linear-Programming System

Performs linear programming in two alternate modes: simplex and graphical.

Current status: **Completed.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Management

Project: Business Law Case Studies
This application includes summaries of selected cases in business law, each followed by a legal question based on that case.

Current status: **Completed.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Stats 'n' Plots

Uses a decision tree to reinforce students' ability to identify specific problem types. Allows students to solve many statistical problems by entering values into appropriate formulas. Shows students the results of changes in any of the values entered. Provides both continuous and discrete plots of a large number of probability distributions.

Part 1 includes formulas for basic probability calculations, discrete and continuous probability calculations, sample size determination, and estimation of a single parameter. Part 2 includes hypothesis testing, analysis of variance calculations, regression analysis, and nonparametic statistical procedures.

Current status: Probable completion in spring 1986.

Contact: Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104

Project: Linear Programming with LINDO on the Macintosh

Linear programming has found wide use in industry for solving problems in production scheduling, distribution, product mix, financial planning, and product blending. The well-known LINDO program for linear, integer, and quadratic programming is now available on the Macintosh 512K. For users familiar with LINDO on other machines, it is a full implementation. For example, it has integer, quadratic, and parametric programming, as well as simple upper and lower bounds, row names, MPS file format interface, and the peruse commands CPRI and RPRI.

LINDO has over 50 commands for data input, editing, optimization, display, logical data inquiry, file handling, and sensitivity analysis. Problems are quickly and easily entered from the keyboard in standard mathematical notation or imported from text files created by other programs, such as text editors.

The mathematical problem that LINDO addresses is that of maximizing a linear function subject to satisfying a set of simultaneous linear equations and inequalities, with some of the variables restricted to being integer.

Current Status: Running and available. Development continuing.

Contact: Linus Schrage, Graduate School of Business, 1101 E. 58th Street, University of Chicago, Chicago, IL 60637; (312) 962-7449

Management

Project: Managerial Economics

Basic statistics programs for use in managerial economics that include simple regression, multiple regression, nonlinear regression, decomposition analysis, smoothing, and Monte Carlo simulation.

Current status: Completed.

Contact: Prof. Barry Keating, College of Business Administration, 135 Hayes Healy Center, University of Notre Dame, Notre Dame, IN; (219) 239-5057 BITNET: FL6BCP@IRISHMVS

Project: Actuarial Models

This project provides Macintosh systems to the actuarial science and risk management and insurance faculty for the development of a pool of actuarial models used in their research and teaching, using Multiplan and TK!Solver.

Current status: **Ongoing—expected to be completed in May.**

Contact: Samuel Cox, Finance, College of Business Administration, University of Texas at Austin, Austin, TX 78719

Project: Travel Agents Management System

Current status: Ongoing.

Contact: Steve Coy, Computer Science, University of Western Australia

Project: Plant Maintenance Scheduling

Current status: Ongoing.

Contact: Steve Coy, Computer Science, University of Western Australia

Project: CPM (Critical path)

Current status: Ongoing.

Contact: Steve Coy, Computer Science, University of Western Australia

MATH & STATISTICS

Project: The Data Desk

The Data Desk is a highly interactive statistics package with capabilities that include data entry and editing, univariate summary statistics, tests and confidence intervals, correlation, simple and multiple regression (including diagnostic statistics), one- and two-way ANOVA, contingency tables and chi-square, scatterplots, histograms, and boxplots, ranking, sorting, generation of random samples from a variety of distributions, transformations specified as general algebraic equations, and generation of patterned data.

Current Status: The Data Desk has been used in teaching large classes at several universities. A student version, including the program, handbook, and data sets, is available for a suggested list price of $35. This version is fully functional but limits data set size. It is available in quantities of 10 or more, and requires only a Macintosh 128K with one disk drive. The professional version is available for $125 and requires a Macintosh 512K. It has no restrictions on data file size other than disk space.

Contact: Prof. Paul F. Velleman, Box 4555, Ithaca, NY 14852; (607) 256-4411

Project: Multiple Regression Template

This Macintosh Multiplan template is configured for data sets with three or fewer independent variables, and performs least-squares multiple regression.

Current status: Completed.

Contact: David Ellerman, Computer Sciences, Boston College, Chestnut Hill, MA 02167

Project: Regression-Sampling Program

Reg Sampler is a regression-sampling program that allows graphic depiction of the variation in regression-coefficient estimates that can occur in repeated samples for a given set of explanatory "X" data, or independent variables.

Current status: Completed.

Contact: David Belsley, Department of Economics, Boston College, Chestnut Hill, MA 02167

Project: Conformal Mapping Program

Developed by: Rice Macintosh Software
Concept: Sam Davis, Chemical Engineering
A graphically oriented program that displays the effects of mappings of the complex plane on contours, computes complex-value functions, and allows student specification of the contours and the mappings.

Current status: Completed.

Contact: Andrea Martin, ICSA, Rice University, Houston, TX 77251; (713) 527-4965

Math and Statistics

Project: Calculus Teaching Package Including a Graphic Tool

Current status: See International section in this issue.

Contact: Neville Smythe, Department of Mathematics, Australian National University

Project: Graphical Display Solutions to Differential Equations

Current status: **Unknown.**

Contact C. Miller, Department of Mathematics, University of Melbourne

Project: Converting MASS STATS Packages from Z8086 to Macintosh

Current status: Unknown.

Contact: Anna Ferrante, Department of Mathematics, University of Western Australia

Project: Plotting Derivatives of a Calculus Function

Developed by: Rice Macintosh Software
Concept: Paul Pfeiffer, Mathematical Sciences
This program allows you to define a function with up to seven coefficients, plot the function, and calculate its derivative.

Current status: Completed.

Contact: Andrea Martin, ICSA, Rice University, Houston, TX 77251; (713) 527-4965

Project: Linear Programming Template

This application is a Multiplan template that uses the simplex method to obtain a solution to linear programming problems.

Current status: Completed.

Contact: David Ellerman, Computer Sciences, Boston College, Chestnut Hill, MA 02167

Project: Mathematics Laboratory

A package for computer-based instruction of calculus developed for the IBM PC is being ported to the Macintosh.

Current status: Expected to be completed by October.

Contact: Craig McGowan, Computer Center, University of Rochester, 727 Elmwood Avenue, Rochester, NY 14620

Math and Statistics

Σx_i

Project: Functions

The purpose of this project is to develop tools for a graphical study of mathematical functions, suitable for both calculus and precalculus work.

Current status: **Probable completion in August.**

Contact: Eugene A. Klotz, Swarthmore College, Department of Mathematics, Swarthmore, PA 19081; (215) 447-7243

Project: Calculus Demos

Designed for lecture/classroom demonstrations of related rates, area under a curve, volumes of solids of revolution, rotation of axes, parametric equations, and polar coordinates.

Current status: **Ongoing.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Matrix Algebra

A program that uses rational arithmetic for solving the following problems: transforming a matrix (up to 6 x 12) to reduced row echelon form, solving a linear system (up to six equations in 11 unknowns), multiplying two matrices (each up to 6 x 12), and finding the inverse of a matrix (up to 6 x 6). Has tutorial and automatic modes of operation.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Math Programs

Dr. Snow has created a number of short graphing and calculating programs in Microsoft BASIC.

Current status: **Complete and ongoing.**

Contact: Dr. Dennis M. Snow, Department of Mathematics, 203 Computing Center and Math Bldg., University of Notre Dame, Notre Dame, IN; (219) 239-6227

Math and Statistics — Medicine

Project: Graphic Math Depictions

With a Macintosh, a mouse, and a math program written at the University of Oregon, even a beginner can draw 3D curves and begin to learn differential geometry theories. More advanced mathematicians can use the Help menu to find the differential equations for that curve and how these equations are solved. As the user moves the curve, the equations change, and the computer calculates those changes and shows the user how it derives the new numbers. Another software program draws fractal curves. With this program, users draw simple constructions (a part of a line, and the computer constructs the rest of the object with intricate complexity. The premise of both of these programs is that anyone can graphically demonstrate complex math concepts and then begin to understand the calculations that support the abstract theories.

Current status: Completed and in use.

Contact: Dr. Richard Koch, Department of Mathematics, University of Oregon, Eugene, OR 97403; (503) 686-5630

MEDICAL

Project: Neurobiology: Waveforms and Filters

This program produces a high/low pass filter that is fully controlled by the Macintosh mouse.

Current status: Completed and available on Creative Solutions MacForth Demo Disk.

Contact: Bruce Land, Cornell University

Project: Analysis of Photomicrographs of Brain Cell Aggregates

Stephen Sellers has written an MS BASIC program for the image analysis of photomicrographs of brain cell aggregates.

Current status: Running and available by request.

Contact: Stephen Sellers, Department of Pharmacology and Physiology, Abbott Hall 318, 947 E. 58th Street, Chicago, IL 60637; (312) 962-9331

Project: Physiology

Models of the dynamics of physiological systems, produced by Professor Heller of the biology department.

Current status: **Unknown.**

Contact: Mike Barlow or Karen Lee, IRIS, Cypress Hall, Stanford University, Stanford, CA 94305

Medicine

Project: Respirator Simulation

The program, designed by Professor Kohatsu, allows the student to simulate the effects of different responses to data from a patient on an artificial respirator.

Current status: **Unknown.**

Contact: Mike Barlow or Karen Lee, IRIS, Cypress Hall, Stanford University, Stanford, CA 94305

Project: Electrolyte Disturbances and Treatment

In Professor Maffly's program, students use help screens and the Calculator to answer questions concerning electrolytes.

Current status: Completed.

Contact: Mike Barlow or Karen Lee, IRIS, Cypress Hall, Stanford University, Stanford, CA 94305

Project: Pharmacy Simulations

This project's goals include incorporating computer simulations and modeling into clinical experimental rotations to assist in the development of patient consultations, utilizing user-friendly technology to facilitate student education, and implementing patient data bases.

Current status: **In development.**

Contact: Larry Ereshevsky, College of Pharmacy, University of Texas at Austin, Austin, TX 78712

Project: Ekteach

Teaches interpretation of the electrocardiogram and tests student with respect to the names of the EKG deflections, the amplitudes, and the time relationships of the normal EKG tracing.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Model Neuron

This program simulates the behaviour of a Hodgkin-Huxley model neuron interactively, relying upon a laboratory metaphor in its user interface. The user has control of electrical stimuli [current injection or voltage clamp] and chemical stimuli [acetylcholine and/or GABA]. The proportion of various membrane channel types and the concentrations of K+, Na+, and Cl- ions inside and outside the cell may be changed by the user as well. Several neurotoxins may be applied to the cell, together or separately. The program should be of use to students of neurobiology, biopsychology, and medical physiology.

Medicine

Current status: Completed and in use in an introductory neurobiology course. The program will be revised based on feedback from Cornell students and others.

Contact: Barry Polley, E503 MVR—Dept. D&EA, Cornell University, Ithaca, NY 14853

Project: Animated Anatomy Tutorial

Students at Washington University Medical School are using a self-study course in human anatomy to depict cell development. The program shows a single cell developing in the womb from a single fertilized egg up to 12 weeks. This development depicts the evolution of the cell into external and internal surfaces of the body, and how these surfaces are then transformed into systems. A dissection on screen demonstrates surfaces and organ systems of the developing embryo. Other topics available on disk are the development of the digestive tube system and the development of the nervous system. Programs covering the circulatory system and genital-urinary system are currently under development. The animation provides 3D instruction at a fraction of the cost of film.

Current status: Completed and ongoing.

Contact: Dr. Roy Peterson, Department of Anatomy, Washington University Medical School, 660 S. Euclid, St. Louis, MO 63110; (314) 362-5000

Project: Scan Analysis

Scan Analysis was developed to provide a low-cost image-processing system for biological and biochemical scientists. The system employs the ThunderScan digitizer, which digitizes autoradiograms, polyacrylamide gels, and so on. The scan file obtained from ThunderScan is then processed using the Scan Analysis program. Three different modes of analysis are available: free-format area selection, area averaging and integration, and two-dimensional scanning and integration. The data obtained from Scan Analysis have been shown to correspond to the actual radioactivity being measured by autoradiography, and to actual protein concentration by dye binding. Coupled with ThunderScan, Scan Analysis brings quantitative image processing to scientists at a very low capital outlay.

Current status: To be completed by April 1986.

Contact: Timothy Burcham, Dept. of Neurobiology, Stanford University School of Medicine, Stanford, CA 94305; (415) 497-5811

MISCELLANEOUS

Project: Programs for Ecological and Statistical Analysis

Current status: Unknown.

Contact: A. Cockburn, Department of Zoology, Australian National University

Project: Drexel Disk

The Drexel Disk uses an interactive map of the Drexel University campus to orient new Macintosh users to the microcomputer-related facilities available.

Current status: Completed.

Contact: **Information Services, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Data Base on Ethical/Legal Issues.

A bibliographic data base that contains references to books and articles on ethical/legal issues of information distribution.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Drexel Plot.

A graphing package designed to plot on a grid data pairs entered from the keyboard or via a SYLK file.
Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: BenchTop Products for the Sciences

The chief software products are The BenchTop, which creates a powerful laboratory network system, and Rascal (see description under "Computer Science"), a real-time Pascal. These applications allow the user to define and operate on-screen simulations of actual laboratory apparatus. The hardware products are a Universal Microcontroller, a laboratory single-board computer based on Intel microprocessors; and the BenchTop Instrument, a customizable, shielded instrument box. Both hardware devices talk to the Macintosh according to a rigorous protocol.

Current status: Universal Microcontroller completed. Consortium price: $500. Retail price: $750.

Contact: Metaresearch, Inc., 110 SE Woodward, Portland, OR 09702; (503) 232-1712

Miscellaneous

Project: Lesson Writer

An authoring tool that enables the user to create short lessons using basic MacWrite procedures and any graphics that can be transferred via the standard Clipboard.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: MacPress

Researchers at Brown (IRIS) are testing a program that allows documents created with MacWrite to be printed on the Xerox 9700 Laser Printer.

Current status: Completed.

Contact: Norm Meyrowitz, Scholar's Workstation Project, Brown University, Providentce, RI

Project: A Skeleton Macintosh Application

Skel is a skeleton demo Macintosh program written in Lisa Pascal that is used for teaching Macintosh development.
Current status: Completed. **Now in Version 2.4.** Send $4 for the disk.

Contact: The Personal Computing Center, 1 McNutt Hall, Dartmouth College, Hanover, NH 03755; (603) 646-3249

Project: ColorPaint

ColorPaint is a Macintosh application for creating color images in the essential style of MacPaint, but with enhancements for three-dimensional graphics, shading and of course, color. The color capability is obtained by connecting the Macintosh serially to a Vectrix VX384 color driver equipped with a high-resolution RGB color monitor.

Current status: Completed.

Contact: Prof. R. Crandall, Reed College, Portland, OR 97202; (503) 771-1112 ext. 277

Project: Atlas

Atlas lets you create a pictorial atlas on the Macintosh, which can be used to teach any subject.

Current status: Completed. **Now in Version .22.** Send $4 for the disk.

Contact: The Personal Computing Center, 1 McNutt Hall, Dartmouth College, Hanover, NH 03755; (603) 646-3249

Miscellaneous

Project: Overlay

Overlay is a program for aligning MacPaint images in preparation for use in Atlas, which can display several images on top of one another.

Current status: Completed.

Contact: The Personal Computing Center, 1 McNutt Hall, Dartmouth College, Hanover, NH 03755; (603) 646-3249

Project: Film Design

Communication students in a film and video class learn "storyboarding" by editing images recorded onto a Macintosh disk using a video camera in conjunction with a commercial program called MacVision.

Current status: **Ongoing.**

Contact: Professor Kristine Samuelson, Department of Communication, Stanford University, Stanford, CA

Project: The TheaterGame

This program lets students use an interactive animation editor to move the characters across the stage and alter their orientation, effectively "blocking" a play on a Macintosh.

Current status: **Now in beta test.**

Contact: Professor Larry Friedlander, Department of English, Stanford University, Stanford, CA

Project: Bibliomania

This simulation introduces students to the use of libraries on campus. The graphics-oriented program also guides the student through the intricacies of searching periodical indexes and an on-line catalog.

Current status: **Beta test scheduled for June.**

Contact: Deborah Murphy, Meyer Memorial Library, Stanford University, Stanford, CA

Project: Mac-Prime-Mac

This application is a protocol that allows you to transfer text or binary files from a Macintosh to a Prime Computer and back to a Macintosh, thereby allowing the Prime Computer to function as a file server.

Current status: Completed.

Contact: **Manager of Software Development, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Miscellaneous

Project: Scientific Graphics.

Scientific data analyses will be the focus of this project. The user will have the ability to specify a function to be plotted or have a smooth line drawn between data points. No pie charts here!

Current status: **Completion expected by October 1986.**

Contact: Craig McGowan, Computer Center, University of Rochester, 727 Elmwood Avenue, Rochester, NY 14620

Project: MAC BRAID

This program computes the Alexander polynomial of a given knot. The knot is specified by giving the cross numbers of its braid representation. (Macintosh Pascal)

Current status: Completed.

Contact: Richard Bedient, Hamilton College, Clinton, NY 13323; (315) 859-4138

Project: Mainframe Print Servers

As a value-added service provided to SEAGate, Macintosh users will be able to print their documents remotely using a VAX or Pyramid Computer as a print server for the LaserWriter or other PostScript machines. In addition, they will be able to convert MacWrite documents to troff to allow addition of technical features using Eqn.

Current status: **Partial completion in May.**

Contact: Craig McGowan, Computer Center, University of Rochester, 727 Elmwood Avenue, Rochester, NY 14620

Project: Electronic Chalkboard

This project uses a Macintosh as a novel electronic chalkboard, permitting drama students in directing classes to illustrate body/eye focus and movement patterns of actors in harmony with recorded voices.

Current status: Completed.

Contact: Bernerd Engel, Drama, College of Fine Arts, University of Texas at Austin, Austin, TX 78712

MUSIC

Project: Mozart

Mozart offers music students with no formal composition experience the opportunity to experiment with musical arrangement, tempo, articulation, and dynamics, allowing them to compose a minuet from any of six predefined two-measure phrases written by Mozart.

Current status: Available now. The disk comes with AppleTones on it (see next entry). Send $4 for the disk (containing the two applications). Now in Version 2.0.

Contact: The Personal Computing Center, 1 McNutt Hall, Dartmouth College, Hanover, NH 03755; (603) 646-3249

Project: AppleTones

AppleTones is a music-building program on the Macintosh that teaches the importance of four things in the composition and arrangement of music: repetition, silence, changes in volume, and timbre.

Current status: Comes on disk with Mozart. Now in Version 2.0.

Contact: The Personal Computing Center, 1 McNutt Hall, Dartmouth College, Hanover, NH 03755; (603) 646-3249

Project: Musical Slide Show

With no programming instruction, users can write music on the screen (notation that can be printed out), hear the score played through the Macintosh's speaker (or an external system), add text and graphics as required, and edit the results to form a "slide."

Current status: Probable completion in **spring 1986.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Baroque Guitar Data Base

To date, over 2,000 separate melodies have been entered into the system, with each entry including author, title, source, page, meter, time signature, key, length, melody (in the original key), melody (transposed to the key of C), type of piece (allemande, courante, prelude, and so forth), correspondences in other sources, and additional notes of interest.

Current status: Ongoing.

Contact: Craig H. Russell, Department of Music, California Polytechnic State University, San Luis Obispo, CA 93407

Music Networks

Project: Simulation of 18th-Century Organ

A simulation of an 18th-century organ in order to illustrate the musical articulation and phrasing of the time. The program, devised by Professor Houle of the music department, will produce sound and musical notation.

Current status: Unknown.

Contact: Mike Barlow or Karen Lee, IRIS, Cypress Hall, Stanford University, Stanford, CA 94305

Project: Fundamentals of Music

A program is being developed for instruction in the fundamentals of music. The first module, which should be completed by the end of summer, deals with intervals and harmony. It has two unusual features: it makes use of sampled sound to provide more realistic tones for interval recognition, and it is not limited to the 12 pitch classes of equal temperament. It will be smart enough to drill students interactively on interval spelling and recognition in either the standard equal temperament or one of several others, but it will also be possible to use it for experimentation—to hear the sounds of various intervals and harmonies as they would be interpreted in different systems of intonation. One of the on-screen keyboards has its claves divided into regions so that a particular enharmonic spelling may be selected.

The program is called Practica Musica and is primarily intended for university music education.

Current status: Ongoing.

Contact: Jeffrey Evans, Department of Music, University of California, Santa Barbara, CA 93106

NETWORKS

Project: AppleTalk Network

Darterminal provides network services to Macintoshes on an AppleTalk network (internet). It runs protocols specific to Dartmouth's Kiewit network and will not run elsewhere without substantial work. It provides:

Current status: Completed (improvements continuing).

Contact: Jim Perry, Kiewit Computation Center, Dartmouth College; (603) 646-2643

Project: SEAGATE

SEAGATE is a network "gateway" between ETHERNET and AppleTalk that allows UNIX to provide servers for Macintosh AppleTalk applications.

Current status: Completed.

Contact: Maria Code, Data Processing Services, 1371 Sydney Drive, Sunnyvale, CA 94097; (408) 735-8006

Project: Washington University Campuswide Network

Washington University is building a campuswide network capable of transmitting pictures between workstations throughout the schools of liberal arts, engineering, medicine, and six other professional schools.

Current status: Continuing.

Contact: Jerome Cox, Ph.D., Chairman, Dept. of Computer Science, Washington University, 509 Bryan Hall, St. Louis, MO 63130

NUTRITION AND FOOD SCIENCE

Project: MacDiet

A nutrient analysis system that includes data on approximately 1,400 foods.

Current status: Multiplan version complete; compiled version (not using Multiplan) available in **Fall 1986.**

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Diet Planner

This is an interactive program for people with kidney disease that aids in the planning and evaluation of proper diet.

Current status: Completed.

Contact: **Prof. Stephen Dubin, Department of Biomedical Engineering, Drexel University, Philadelphia, PA 19104**

Project: Newdiet and Prodiet

These are Multiplan programs designed to solve nutritional composition problems involving linearly additive dietary elements as well as computation of the chemical score, an index of relative protein quality.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

PHILOSOPHY

Project: Venn, a Philosophy Tutor

This program allows the student to solve syllogisms by using Venn diagrams.

Current status: Available now. Comes with the program called Binary Trees (see "Computer Science"). Now in Version 2.0. Send $4 for the disk with both applications.

Contact: The Personal Computing Center, 1 McNutt Hall, Dartmouth College, Hanover, NH 03755; (603) 646-3249

PHYSICS

Project: Interference Scanning Using ThunderScan

Current status: Unknown.

Contact: M. Andrews and J. Sandeman, Department of Physics, Australian National University

Project: Interface with LeCroy Fast Digitizer Through IEEE 488 Bus

Current status: Unknown.

Contact: M. Andrews and J. Sandeman, Department of Physics, Australian National University

Project: Elementary Quantum Mechanics

Five programs that compute the following: transmission/reflection coefficients and energy eigenvalues for bound states (in piecewise constant potentials); energy bands and density of states (in one-dimensional, piecewise, continuous periodic lattices); energy eigenvalues in arbitrary binding potentials.

Current status: Completed, but not yet documented.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: General Teaching Applications in Physics using PASCAL Workshop

Contact: Dr. C. Edwards, Department of Physics, University of Western Australia

Current status: Unknown.

Physics

Project: Introductory Physics Lab

These applications include prelab interactive tutorials, data collection and analysis, curve fitting, and graphical display.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Data Acquisition Control

An application for use in the freshman physics laboratory that analyzes, records on disk, displays, and can replay data collected during the experiment.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Basic Physics Applications

A series of 14 programs in basic physics intended for use in lecture demonstrations and for individual study by students.

Current status: Completed.

Contact: **Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104**

Project: Elementary Particle Theory

Four programs (of a total of eight) have been developed by Prof. Savas Dimopoulos for a physics series on elementary particle theory and on symmetrics and Lagrangians.

Current status: Completed and continuing.

Contact: Prof. Savas Dimopoulos, Stanford University, Stanford, CA

Project: Freshman Physics Lab

A set of data-acquisition tools, partially based on the Reed College DeskTop hardware, for the freshman physics lab.

Current status: **Completed and in use.**

Contact: Craig McGowan, Computer Center, University of Rochester, 727 Elmwood Avenue, Rochester, NY 14620

Project: Physics Simulations

A series of simulations (based on rapid animation) to enable students to explore atomic theory, diffraction, electrostatics, harmonic motion, magnetism, monopoles, orbital physics, projectile motion, quantum mechanics, radiation, and special relativity without inappropriate or tedious calculations.

Current status: Completed

Contact: Professor Blas Cabrera, Department of Physics, Stanford University, Stanford, CA

Project: Animated Waves and Particles

Three animated graphics programs illustrate standing waves, traveling pulses, group velocity, sound waves, and electromagnetic waves; pressure, temperature, and gravity effects on an ideal gas, Brownian motion, diffusion through a hole, and electric and magnetic effects on moving charges; and the wave properties of an electron in an atom.

Current status: To be completed in fall 1986.

Contact: Eric T. Lane, Physics Department, The University of Tennessee at Chattanooga, Chattanooga, TN 37403-2598; (615) 755-4523

PSYCHOLOGY

Project: Stimuli for Recognition Memory Experiments

In 1980, Snodgrass and Vanderwart published norms for 260 line drawings. Each drawing is rated on name agreement, image agreement, familiarity, and visual complexity. These stimuli have been digitized and stored in MacPaint format for easy use in memory experiments.
By: Dave Lane—Rice University

Current status: Completed. Price: $15 for two disks, payable to Rice University Psychology Department.

Contact: David M. Lane, Department of Psychology, Rice University, Houston, TX 77251-1892; (713) 527-8101 ext. 3412

Project: Three Products

Machine Language Library for Use in Psychology Experiments, Demonstration Experiments in Psychology, and Geometrically Rotated Text.

Current status: Completed. Purchase price—all three disks for $15. Make checks payable to Rice University Psychology Department.

Contact: David M. Lane, Department of Psychology, Rice University, Houston, TX 77251-1892; (713) 527-8101 ext. 3412

Psychology

Project: Mac Laboratory Interfaces

Psychology Professor Allan Wagner is currently investigating use of the TAURUS system with MACQUISITION, a product of Small Business Computers of New England, in his animal learning lab.

Current status: Continuing. Version 1.2 available. Version 2 probable completion in early spring.

Contact: Prof. Allan Wagner, Yale University, c/o Box 220, Yale Station, New Haven, CT 06520

Project: Experimentation Package for Human Information Processing Research

This program allows the experimenter in the field of experimental psychology to carry out sophisticated research in the study of human information capabilities.

Current status: First version will be completed in spring 1986.

Contact: Salvador Algarabel, Universidad de Valencia, Facultad de Psicologia, Blasco Ibanel, 21, 46010, Valencia, Spain; (96) 3694850, ext. 213

Project: Biopsychology

The Macintosh mouse and MacPaint software will be used to track and record animal behaviors in an arena under different conditions of thermal and neuroendocrine manipulation.

Current status: Completed.

Contact: Timothy Schallert, University of Texas, Austin, TX 78712

Project: MacLaboratory for Psychology

Provides research-grade software and university-level interactional teaching materials. Total package consists of a laboratory manual designed for introductory or experimental psychology, five disks, and documentation. Most applications create an adjustable piece of psychological apparatus, providing tools for real research activities.

• Part 1: Perceptual and Motor Skills. Various experimental settings permit the study of motor skill learning and eye-hand coordination using such tasks as mirror tracing and pursuit rotor tracking. Data are saved as text files. Neuropsychology of CNS. Tutorial illustrates anatomical and behavioral relationships among the major cortical and subcortical structures of the central nervous system.

• Part 2: Problem Solving. Used to investigate the social interaction of group size with task difficulty. Stimulus files and experimental conditions are readily edited permitting a number of problem solving tasks. Data are saved as text files. Hemispheric Function. Permits tachistoscopic presentation of stimuli to any portion of either visual field under accurate and flexible experimental control. Standard Macintosh features allow creation of files for a wide variety of visual stimuli. Data saved as text files.

• Part 3: Polygraph. Simulated GSR (Galvanic Silicone Response) which—with appropriate user interaction—can illustrate orienting response, habituation, classical conditioning, extinction, spontaneous recovery, partial reinforcement, and other concepts from the psychology of learning. Data on GSR latency, amplitude, and duration saved as text files. Reaction Time. Completely editable verbal and pictographic stimulus sets can be prepared for presentation in various portions of the visual field under precise experimental control. Traditional reaction-time paradigms are measured to millisecond accuracy. Data can be saved as either text or SYLK files.

• Part 4: Pitch Discrimination. For the psychological study of pitch. Waveform, frequency, amplitude, and duration can be modified and arranged into various sets for auditory testing. Data can be saved as either text or SYLK files. Stimulus Maker, Tone Generator, and Data Collector. Applications provide an easily edited system using musical notation to create experiments in auditory memory, particularly recognition, recall, and short-term memory.

• Part 5: Survey Questionnaires and Survey Data Summary. Applications facilitate the collection and simple summary of survey data. Both open comments or multiple-choice responses are possible, with the former saved in text files and the latter in SPSS or SYLK formats.

Current status: Parts 1 and 2 complete now; probable completion of total package in September 1986.

Contact: Special Projects Director, Office of Computing Services, Drexel University, Philadelphia, PA 19104

SOCIOLOGY

Project: SocStat: A Program to Compute Sociological Statistics

SocStat uses data sets from actual sociological surveys and allows the student to do elementary statistical analyses on them.

Current status: Completed. In Version 1.2 currently (will be in Version 2.0 in January/February 1986). Send $4 for the disk.

Contact: The Personal Computing Center, 1 McNutt Hall , Dartmouth College , Hanover, NH, 03755

TELECOMMUNICATIONS

Project: Kermit
Developed by: Andrea Martin—Rice University
Kermit lets microcomputers and mainframe computers communicate and transfer files safely.

Current status: Currently on hold.

Contact: Andrea Martin, ICSA, Rice University, Houston, TX 77251; (713) 527-4965

Project: Macintosh Kermit

The Columbia University Center for Computing Activities completed a Kermit program that provides file transfer and terminal emulation for the Macintosh and Macintosh XL computers, allowing them to communicate with a large and diverse collection of mainframes, minicomputers, and microcomputers.

Current status: Available through Kermit Distribution (212) 280-3703.

Project: SEAGate

The Stanford Ethernet—AppleTalk Gateway (SEAGate) is being implemented.

Current status: **Complete.**

Contact: Craig McGowan, Computer Center, University of Rochester, 727 Elmwood Avenue, Rochester, NY 14620

Project: MacShell—A Sophisticated Terminal to UNIX

MacShell provides a sophisticated multiwindow interface to the UNIX operating system.

Current status: Unknown.

Contact: Tim North, Department of Computer Science, University of Western Australia, Stirling Highway, Nedlands 6009, Western Australia

Project: LaserTerminal: Serial-to-AppleTalk Gateway

LaserTerminal is a program developed at Reed College that makes the Macintosh function as a gate between an RS-232 serial line (for example, from a mainframe computer) and AppleTalk, enabling LaserWriter printing of PostScript documents.

Current status: Completed.

Contact: Marianne Colgrove, Education and Documentation Coordinator, Development Lab, Reed College, Portland, OR 97202

Telecommunications

Project: GriffinTerminal 100

GriffinTerminal 100 (GT100), developed at Reed College, is a terminal-emulation application for the Macintosh that can function in either Tektronix 4012 or VT100 mode, and can handle technical graphics.

Current status: Completed.

GT100 is available through: Metaresearch, Inc., 1100 SE Woodward, Portland, OR 97202; (503) 232-1712

Price: $99 (academic discounts available).

Technical Contact: Scott Gillespie, Software Development Manager, Development Lab, Reed College, Portland, OR 97202; (503) 771-1112 ext. 277

Project: Communications Link with Sigma Data WP Units

Current status: Complete.

Contact: J. Radnell and P. Wesely-Smith, Department of Asian Studies, Australian National University

Project: Communications Link with Epson WP Unit

Current status: Planned.

Contact: J. Radnell and P. Wesely-Smith, Department of Asian Studies, Australian National University

Project: Macintosh Videotex Terminal Emulation

Current status: Unknown.

Contact: K. Loane, Information Science, University of Tasmania

Project: MacWrite to Scribe Formatter.

Current status: Unknown.

Contact: David Hawkins, Computer Science, Australian National University

WORD PROCESSING

Project: MacWrite Translator

The translator consists of two programs that allow you to translate a document from MacWrite version 3 (RAM-based) format to that of another word processor.

Current status: Public domain software available now.

Contact: DCS, 401 URIS Hall, Cornell University, Ithaca, NY 14853

Project: GriffinText

GriffinText is a fast, no-frills text processor developed at the Reed College MacLab.

Current status: Completed and available. Consortium price: $39. Retail price: $69.

Contact: Prof. Richard Crandall, Reed College, Portland, OR 97202; (503) 771-1112 ext. 277

Project: LaserWriter Driver for IBM PC Scientific Word Processor

Current status: Unknown.

Contact: Neville Smythe, Department of Mathematics, Australian National University

Project: Indexer for MacWrite

This project allows automatic or interactive indexing/cross-referencing/keywording.

Current status: Completed.

Contact: Neville Smythe, Department of Mathematics, Australian National University

Macintosh Products

Introduction

The Macintosh Products portion of ***Wheels for the Mind*** provides information about third-party products for the Macintosh. Where appropriate, information is organized by application area. Any review of products is unashamedly subjective and usually reflects the opinions of one user; please use the reviews only as a reference point. In order to make it as easy as possible for you to keep up with what is available, **new listings appear in boldface.**

Some products that you would expect to see in this listing are not yet here. This, too, will change in the near future. As time passes, we hope to have an exhaustive list of Macintosh products. As we progress through the year, **this list should become annotated with the experiences and comments of all you readers out there.**

Thus, in time, this section could become a very valuable resource for those selecting or recommending available Macintosh products. In fact, it may be the only such reference available. However, it will only work if you help. **Please send in your observations about the Macintosh products you have used.**

This section consists of two parts:

Part 1 contains some fairly complete descriptions of a few new products that might be of interest to our community.

Part 2 provides a brief listing of a variety of other products along with article references when available.

Part 1: Product Features

New Interactive Video-Authoring System

Many people have been eagerly anticipating the day when personal computers, videodiscs, and presentation technologies become both easier to use and more affordable. The ability to use interactive video in the classroom, in individualized instruction, and in our personal and professional presentations will significantly impact the way we function as educators.

Technology is rapidly changing—and in many ways improving—the way educators share their expertise. Authoring systems, microcomputers, videodiscs, and CD-ROMs are now readily available as additional resources for the teacher. And the ease of use of the Macintosh has made the personal computer an attractive teaching and research tool for a large number of faculty members—many of whom previously would have considered themselves unlikely computer users.

One unique authoring system for the Macintosh allows on-site videodisc recording/playback and is available from Educdisc, 3501 Amanda, Nashville, TN 37215; (615) 269-9508.

This package allows the reworking of "generic" videodiscs to create customized lessons. The text and graphics information is easily updated on the Macintosh, and randomly accessed video segments are captured from the videodisc and displayed on a monitor.

The system combines Panasonic's instant disc recording with the high-powered authoring capabilities of Edudisc software. This can significantly shorten application development time, as well as dramatically cut costs.

According to Mike Moore, president of Educdisc, "Normally, pressing a videodisc requires that a specially edited one-inch videotape be sent away to a disc-pressing facility for mastering. That takes an average of $2,000 and up to two weeks, over and above the initial video production costs. Then, if the disc needs to be updated or frames added, the whole tape-editing and mastering process has to be repeated, causing simple modifications sometimes to cost as much as the original."

The Panasonic OMDR eliminates this process, because the videodisc is never mastered. Instead, video is recorded directly on the disc, allowing users to add segments of video at any time.

Edudisc provides the Panasonic OMDR with a user-friendly interface for controlling all aspects of recording and playing. Users can record or play back any sequence of still frames or moving segments at the click of a mouse.

Available Products

MacAuthor—MacAuthor authoring software is an entire course-development package, a do-it-yourself set of curriculum formats into which trainers, educators, and courseware producers can "plug" their materials. Presentation formats include Text, Art, Multiple Choice, Fill in the Blank, Relational, and Ready Reference options. Integrated branching permits easy-to-do courseware complete with review and user-evaluation features. Launch to all other Macintosh applications or your own programs. Useful for all sorts of interactive presentations.

Requires: Macintosh 128K or 512K with external disk drive
Price: $200 (site license available for multiple users)

Mentor/MacVideo—Videodisc courseware authoring for interactive video presentations. Instructional formats provide Text, Art, Video, Multiple Choice, Fill in the Blank, Relational, and Ready Reference options. Video sequences (motion, stills, and audio) edited on MacVideo play interactively with content in Mentor authoring program. Integrated branching permits easy-to-do courseware complete with review and user-evaluation features. Launch feature integrates other Macintosh applications or your own programs.

Requires: Macintosh 128K or 512K with external disk drive
Videodisc: Panasonic 2023F, 2024F or Sony LDP1000(A), 2000 series, Pioneer LD-V6000, 6010 (interface provided); NTSC video monitor
Price: $595 (site license available for multiple users)

Portfolio—Image-archiving software to record, catalog, and retrieve stills on videodisc. Classify up to 24,000 quality images per disc. Catalog all types of still images including art, science, and historical information. Use existing CAV videodiscs, or record on your own 8-inch Panasonic disc.

Requires: Macintosh 512K with external disk drive
Videodisc: Panasonic Recorder/Player 2023F or Sony LDP1000(A), 2000 series, Pioneer LD-V6000, 6010 (interface provided); NTSC video monitor
Price: $1,500 (site license available for multiple users)

TimeMaster—Record time-lapsed sequences onto videodisc with a video camera to eliminate the usual videotape editing procedures. The photographer keys in the length of the entire video sequence and how many frames per second, per minute, and per hour are to be recorded. The recording unit is "left in place" to record according to desired time lapses. Perfect for advertising and creative video effects.

Requires: Macintosh 512K with external disk drive
Videodisc: Panasonic Disc Recorder 2023F (interface provided); NTSC video monitor
Price: $1,000 (site license available for multiple users)

Edudisc also has formed a courseware user group. It will give members the right to access Edudisc's course and image library in exchange for contributing their own courseware and images. In addition, a publication cataloging subscribers' courses and images—*Higher Ground* —will be distributed nationally.

Advantages to the Educator

The advantages to the educator of using this technology include the ability to do the following:

- Customize presentations in your subject area.
- Combine interactive videodisc and computer-based materials.
- Merge text, graphics, and questions on the Macintosh screen using multiple windows.
- Rework your videodiscs or record your own.
- Evaluate individual and group performance.
- Choose from 10 presentation formats for multiple uses.

Edudisc's package provides teachers with the means to present their material more effectively. Here are some of the characteristics of the authoring system:

Features	Benefits
Does not appear to be a programming language, because the preprogrammed formats don't allow you to make a mistake.	Eliminates need to rely upon software programmed by experts. You can do it yourself!
Questions, text, graphics, and videodisc clips can be presented simultaneously.	Enables multimedia presentations that meet a variety of learning styles.
Optional randomization of answers.	Saves course authors the hassle of randomizing the answers.
Labeling of art/graphics.	Lets you link graphics to textual and contextual information.
Questions and answers can be evaluated on both a group and an individual basis.	Allows the adjustment of the course to meet the needs of the student and the class.
Videodisc clips are titled for easy identification.	Eliminates bother of frame numbers. This allows nonprofessionals to edit videodisc information according to their particular needs.
Launch enables the creation of different courses and curriculum modules.	Lets courses and curriculums be tied together in ways meaningful to existing school curriculum programs. Other Macintosh educational programs may be launched to in order to create specialized courseware.
Integration of many other Macintosh programs.	Allows enhancement and greater utility of courseware. Mentor provides the framework for this.
Allows word/sentence responses.	Removes limits of selection formats. Synonyms can be used to increase the number of possible correct answers.
Unlimited branching allows you to go anywhere in the course.	Enables the creation of complex levels of interaction.

Courses may be edited while they are being run.	Permits easy modification—on-the-spot correction of mistakes or ineffective presentations. Lets you create in-house custom videodisc courseware in weeks, rather than months.

Work in Progress

Current projects in this area include the following:

- **Cornell Medical School** [site license: Mentor/MacVideo]
  Clinicopathologic Conference Courseware Development. A symptomatic case history is presented accompanied by statements from various physicians. Along with the case is a quiz that incorporates videodisc information and digitized graphics of the video images. These graphics are created with MacVision and labeled in MacDraw. They appear in Mentor's art window in conjunction with the textual information, followed by questions.

  Included in Cornell's system is a Panasonic Videodisc Recorder, which its staff uses to master their own discs using existing slides, X-rays, and so forth. In effect, they have complete control over the entire video courseware design, development, and production process from start to finish. The doctors create their text materials as MacWrite documents, and assistants download them directly to the Mentor course.

  Cornell medical students attend a weekly conference during which doctors discuss a case. The relevant videodisc images are projected during the discussion. Later, students have the opportunity to examine this information more closely and view the images in a Macintosh lab setting. Each Macintosh workstation incorporates a videodisc player and the computers are networked on a Zilog 8000 file server.

  This program has received excellent reviews from doctors, students, and administration.

- **Bloomsburg University** [site license: Mentor/MacVideo]
  The Center for Instructional System Development was established to further develop and refine Computer-Based Interactive Video Technology (CBIV) for the multifaceted use of curriculum materials. The primary goal of the center is to actively engage campus faculty in the design and implementation of microcomputer-based courseware in their classes. The center received a large grant from the Commonwealth's Ben Franklin Partnership Program to develop CBIV materials for critical-care nursing training. All programming aspects of this project are performed on the Macintosh computer by undergraduate students and graduate assistants in the university's master's program in instructional technology.

  The private-sector sponsors of the grant program include the local Geisinger Medical Center, where the developed materials will be used immediately after production, Edudisc, and DuPont. The instructional material is being developed and will eventually be offered for the Macintosh computer.

  The Center for Instructional System Development uses public domain audio/video information. It will soon be mastering its own discs and producing a variety of interactive materials to supplement professors' texts and lectures. It will also be exploring other occupational areas (besides nursing) in which interactive-training opportunities exist.

  University-related faculty projects include chemistry simulation courseware, sign-language training, and recording/cataloging 50,000 art images for the art department.

- **Tennessee Wesleyan College** [site license: Mentor/MacVideo]
  The Environmental Resource Center is developing interactive videodisc courseware using Panasonic and Sony videodisc equipment. They are currently cataloging the school's biology slides using Edudisc's disc-recording services. The science images are shown in several biology classes, and plans call for the establishment of a student Macintosh lab.

  Wesleyan is also working with the Tennessee Valley Authority to develop interactive training programs for such applications as boating-safety kiosks and industrial training for various TVA projects.

- **Miami University Medical School** [MacAuthor]
  Developing student instructional materials. Project not yet under way.

- **Dartmouth College** [Mentor/MacVideo]
  The Office of Instructional Systems and Educational Resources is researching human perception. Other development work is planned.

- **University of Washington** [Mentor/MacVideo]
  The Health Sciences Center is using Mentor/MacVideo with the Pioneer and Macintosh to develop materials on anatomy/histology in conjunction with a medical videodisc it produced.

- **Harvard** [Mentor/MacVideo]
  Developmental work with students who are learning about multimedia instruction is just now getting under way. This semester, Harvard's Graduate School of Education is having students evaluate Edudisc's authoring tools.

- **Queens College CUNY** [Mentor/MacVideo]
  Federal grant proposal to develop a model science curriculum for students in grades 5–8. Traditional lab experiences will be integrated with computer simulations, experiments based on locally produced data bases, and interactive videodisc activities with the Edudisc system.

- **Mills College** [MacAuthor]
  Chemistry courseware is now being developed by college faculty. These professors will distribute their own courses or participate in the Kinko's/Apple's Courseware Exchange.

- **Arizona State** [MacAuthor, Mentor/MacVideo]
  University Media Systems is testing instructional designs. The university is planning to have professors develop courseware for distribution through Kinko's.

In addition to university multimedia activity, several projects are under way in the training field:

- **Peat Marwick Mitchell** [site license: MacAuthor]
  The training department has developed courseware on audit diagnostics for its continuing CPA education program. It will be used in 100 field offices and in conjunction with regular corporate training programs.

- **California Youth Corrections Department** [site license: Mentor/MacVideo]
  Establishing a Macintosh-based videodisc training center for its program administrators and youth corrections officers. This will be a showcase project for other agencies in the state.

- **Arizona Department of Transportation** (Aeronautics Div.) [Mentor/MacVideo]
  Training courseware will be developed in addition to special videodisc projects for analyzing airport sites.

User Feedback

Perhaps the "bottom line" for a multimedia authoring package is the reaction of those who have actually used it. Below is some feedback obtained from current Mentor users:

Edudisc has developed an elegant approach to building interactive learning systems. The values of these innovations are in the ease with which their systems can be learned and used and that they work with existing material in any format (slide, film, video, audiotape) as well as with newly created material.

I see two key advantages and use areas springing from these values. The first is retrofitting existing audiovisual resources to make them interactive. Our experience shows this can decrease learning time by 30 percent to 70 percent, while more than doubling learning effectiveness. The second area is prototyping new material. Authors need some quick, low energy investment way to try out their ideas. The Edudisc system gives them this. The bottom line is better resources, with faster turnaround and lower ultimate production costs.

Thomas Jenkins
Manager, HealthCare Learning Systems
E. I. Du Pont de Nemours & Co.

When teachers used SuperPILOT on the Apple, they could incorporate graphics and sound on the Apple computer. With the Whitney board, it was also possible to add video —either tape or disc. I used to think this was the ultimate until I used Mentor on the Macintosh. I think it will replace SuperPILOT, and instead of showing teachers how to use PILOT, we will be demonstrating the strengths of Mentor.

Art Fesemyer
Northeastern Educational TV

We were intrigued by Mentor's complexity in design, yet impressed by its simplicity and user friendliness. After seeing the system, it's hard to believe the cost estimates that other places are quoting for development of a one-disk course. It was easy to see that the Edudisk approach has simplified the interface needed to create an interactive video course by nontechnical users, and that the elimination of the technical users will allow for dramatic savings.

Miles Moramoto
Calvert Group

During a course I taught on programming for interactive video, I had 14 students use several authoring systems. The class was most favorably impressed with Mentor/MacVideo's revolutionary approach to creating instructional software.

I made one observation I thought interesting. SuperPILOT was also being taught in the same course to cover interactive videotape technology. Students with stronger programming backgrounds were initially more attracted to SuperPILOT than Mentor. The reverse attitude occurred for persons with no programming backgrounds. The more experienced programmers had difficulty adjusting to the nonsyntax simplicity of Mentor curriculum formats. However, by the end of the course everyone was excited with Mentor.

Hank Bailey, Professor
Computer Science and Mathematics
Bloomsburg University

MacVideo should go to Hollywood! Mentor is the best authoring software I've seen. Mentor is made for people who don't understand computers, but who want to create their own software. I have a hard time keeping everyone away from editing the videodisc! Are you interested in having us develop some medical applications for you?

Dr. Steven Erde
Department of Pathology
Cornell Medical School

It's so easy! After being piled in script sheets and storyboards! All I have to do now is organize the content and video, then sit down, create, and edit. It's great!

Amy Vasquez
Skilled Nursing, Inc.

I recently completed my first videodisc and course on a history of blues music, titled "Somewhere Down the Line." I gathered public domain video and used my university's studio to record it all on videotape. Edudisc then mastered the tape onto videodisc for me. I'll use this course to supplement my "Popular Culture" class lectures. Edudisc has created what may well be the most innovative and easy-to-use teaching device to become available in quite some time. As one who was formerly computer ignorant, I was certainly hesitant to tackle the "iron cage." Film enthusiasts wil be happy to hear that I was able to edit portions of the film in 10 minutes!

John Wells, Ph.D.
Associate Professor of Sociology
Mary Baldwin College

What's Next?

Technology in this area is constantly changing, and Edudisc plans to keep pace with all of the latest developments.

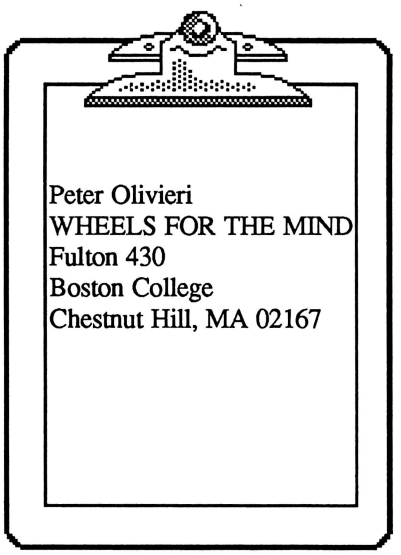
Future plans include:

- Adding graphics-overlay options to the existing system. These will be adapted from an existing Macintosh hardware converter that interfaces the Macintosh screen with NTSC video. The application will take the form of a MacPaint coloring program that allows the author to create and store up to 16 color graphics, and overlay them in a presentation.

- Taking advantage of the SCSI port and the megabyte of memory on the Macintosh Plus to add other devices to the current system. This would include CD-ROM and optical digital disc drives.

Attention Developers

If you have an interesting Macintosh application, send us a copy of it (please include any specifics about how members of the educational community might best use your product). Descriptions sent on disk are especially appreciated. Make a note to send the information to:



Part 2 : Product Descriptions

Business

Front Desk by Layered, Inc., maintains schedules for up to 15 people, places, or things, allowing the user to look at everyone's calendar, weekly schedule, or monthly schedule. Helps keep appointments and schedules. (617) 423-9041 (Mass.).

Spreadsheet Link by Dow Jones (used with Multiplan) and Dow Jones **Market Manager PLUS** for portfolio management. (800) 345-8500, x100.

Business: Accounting

Back to Basics Accounting System by Peachtree Software is an uncomplicated, easy-to-learn accounting system for small businesses. Includes General Ledger, Accounts Payable, and Accounts Receivable. (800) 554-8900.

General Ledger is the first model in a series of business-related software to be introduced for the Macintosh. It allows the user to create a balance sheet, profit and loss statement, and a trial balance. The SmoothTalker speech synthesizer is incorporated into the application to warn of errors and mistakes. Some of the possible reports include projected income and expense accounts, comparative analyses, variance reports, detailed journals, P&L statements and much more. Price: $395. Vendor: Future Design Software, 13681 Williamette Dr., Westminster, CA 92683; (714) 891-9796.

Accounting Series for a hard disk (the Tecmar hard disk is necessary; other drives will be added to the compatibility list shortly). The first modules to be announced include General Ledger, Accounts Receivable, Accounts Payable, Payroll, and Inventory Management. (Other modules under development are Job Costing, Estimating, and Prebilling.) Each module retails for $695. Vendor: Great Plains Software, 1701 S.W. 38th St., Fargo, ND 58103; (701) 281-0550.

Maccountant is an accounting package designed for small businesses. With it, you can prepare income statements, accounts payable, accounts receivable, balance sheets, and general ledger accounts. Free demo disk available. Price: $195. Vendor: Digital Etc., 1749 14th St., Santa Monica, CA 90404; (213) 452-5636.

Maccountant	MACUSER	Dec. 85	p. 58

Dollars and $ense by Monogram helps you manage your money. It defines budgets on up to 120 accounts, writes checks, makes transactions automatically, and can prepare a full set of reports and graphics. (213) 215-0529 (Calif.).

Dollars + Sense	MACAZINE	Vol.3 No.1	p. 18

Accountant's Choice	MACUSER	Dec. 85	p. 56
Check Mark General Ledger	MACUSER	Dec. 85	p. 56
Mac OneWrite	MACUSER	Dec. 85	p. 58
Mac OneWrite	MACWORLD	Mar. 86	p. 123
Palantir - Accounting	MACUSER	Dec. 85	p. 114
Palantir Financial Series	MACAZINE	Vol.3 No.1	p. 13
Rags to Riches - Accounting	MACUSER	Dec. 85	p. 114
Rags to Riches	MACAZINE	Vol.3 No.1	p. 14
Strictly Business -Accounting	MACUSER	Dec. 85	p. 114

Business: Taxes

MacInTax is an income tax program for individuals. It is mouse driven and contains the complete IRS instruction book on disk. Call to see if it contains the IRS forms that you need. Price: $75. Vendor: SoftWeave, 400 Mobil Ave. Bldg. D, Suite C, Camarillo, CA 93010; (805) 388-2626.

Macintax	MACWORLD	Mar. 86	p. 88
Macintax	MACAZINE	Vol.3 No.1	p. 64
Macintax	MACUSER	Jan. 86	p. 46

Tax Wizard is a program that allows access to more than 20 IRS forms. Call to see if it's ready and if it contains the IRS forms that you need. Price: $64.95. Vendor: Software Resource (distributor), 817 Tenth St. #102, Santa Monica, CA 90403; (800) 851-9010 or (800) 851-9009.

Tax Wizard	MACUSER	Jan. 86	p. 48
Tax Wizard	MACAZINE	Vol.3 No.1	p. 64
Tax Wizard	MACWORLD	Mar. 86	p. 89

Tax Planner uses Microsoft's Multiplan to provide a very comprehensive set of tax templates. Complete tax tables are included. Call to see if it's ready and if it contains the IRS forms that you need. Price: $49.95. Vendor: Apropos Software, Inc., 64 Hillview Ave., Los Altos, CA 94022; (415) 948-7227.

Tax-Prep uses Microsoft's Multiplan package to help the wage earner prepare up to 22 different tax schedules and forms. Call to see if it's ready and if it contains the IRS forms that you need. Price: $99.95. Vendor: EZ Ware Corporation, 17 Bryn Mawr Ave., Bala Cynwyd, PA 19004; (215) 667-4064.

Tax-Prep	MACUSER	Jan. 86	p. 48
Tax-Prep	MACWORLD	Mar. 86	p. 90

Tax Manager calculates, prepares, reviews, and prints federal income tax forms. It automatically will choose the method that results in the least amount of tax for your income situation. Call to see if it's ready and if it contains the IRS forms that you need. Price: $180. Vendor: MicroLab, 2699 Skokie Valley Road, Highland Park, IL 60035; (312) 433-7550.

Tax Plan	MACWORLD	Mar. 86	p. 90
Tax Master	MACWORLD	Mar. 86	p. 91

MegaForm is a forms designer that functions as a spreadsheet, data base, forms generator, and report generator. Information on one of your customized forms can be automatically calculated, much like a spreadsheet. Provides a library of ready-made forms ranging from invoices to tax forms; numbers forms sequentially; works with preprinted forms, if you wish; has MacPaintlike

drawing tools; and provides a selection of business graphics for your use. Vendor: Megahaus, 5703 Oberlin Drive, San Diego, CA 92112; (800) 358-8882, or in California, (619) 450-1230.

MegaForm	MACUSER	Feb. 86	p. 69

MacFinance is a financial analysis application. With it, you can determine the future value of an investment or calculate liquidity ratios, market ratios, activity ratios, ROI, depreciation, cost analyses, BE analysis, and bond yield analysis, as well as loan and mortgage calculations. Price: $99.95. Vendor: Superex Business Software, 151 Ludlow St., Yonkers, NY 10705; (800) 862-8800, or in New York, (914) 964-5200.

Stock Portfolio System helps you manage a portfolio of stocks, bonds, mutual funds, options, CDs, and money-market funds, as well as other cash investments. Once data has been entered (either typed in or downloaded from Dow Jones), nine reports can be generated. These include profit and loss statements, current portfolio status, interest income and expenses, and a dividend income statement. Up-to-date tax laws (1984) are included. You need a Macintosh 512K. Price: $225 (annual updates will be $65). Vendor: Smith MicroSoftware, Inc., P.O. Box 7137, Huntington Beach, CA 92615; (714) 964-0412.

The Investor is designed as an aid in financial decision making and tax planning. It is a computerized management system for handling stocks, funds, bonds, margin accounts, and much more. The standard analysis reports are possible. A graphics feature allows the user to plot various relationships. Automatic updating by connecting to Dow Jones service is supported. A simulation feature permits the asking of "What if?" questions concerning your buying and/or selling preferences. Price: $150. Vendor: P^3, Inc., 949 Parklane Center, Wichita, KS 67218; (316) 686-2000.

MindSight brings the power of a sophisticated decision-support system to the Macintosh. With it, you can create business plans and financial models through the application of plain English logic to available data. Built-in communications software allows you to retrieve data from a mainframe, manipulate the data on your Macintosh, and then send the results back to the mainframe. ExecuCom Systems Corporation, 3410 Far West Blvd, Austin, TX 78731; (512) 346-4980.

SideKick can help you organize your desktop and manage telecommunications. No matter which program you're running, SideKick provides a calendar, appointment alarm, "To do" list, background printing, auto dialing for telecommunications and more—all at the click of a mouse. (Some functions require additional hardware). Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066.

SideKick- DA	MACWORLD	Mar. 86	p. 107
SideKick	MACUSER	Dec. 85	p. 112

PageMaker is a page-composition tool that allows the user to design very sophisticated copy for printing on a LaserWriter or as camera-ready copy. This entire issue was prepared using PageMaker. It is the kind of product that could have been listed under Graphics or Word Processing as well. Users can place MacWrite or Microsoft Word documents on a sample (reduced size) page. Pictures and graphics can easily be incorporated. Graphic images can be cropped as well as proportionally reduced. This is an excellent product with many advanced features that facilitate the preparation of professional-looking publication materials. Available from Aldus Corp., 616 First Avenue, Suite 400, Seattle, WA 98104; (206) 467-8165.

MacPublisher is sofware that helps produce camera ready copy for page layouts. It is a very nice desktop publishing package available at a reasonable price. Boston Software Publishers, Inc., 1260 Boylston St., Boston, MA 02215; (617) 267-4747

Business-Related Articles

Gallery Finance	MACUSER	Dec. 85	p. 54
MacProject	MACAZINE	Vol.2 No.12	p. 51
MacProject	MACUSER	Mar. 86	p. 54
Micro Planner	MACAZINE	Vol.2 No.12	p. 51
Micro Planner	MACUSER	Mar. 86	p. 54
Profit Projections/Break even	A+ MAGAZINE	Mar. 86	p. 135
WillWriter	MACUSER	Jan.86	p. 34

Computer Languages

Microsoft BASIC 2.0 is available from Microsoft. It is significantly better than the earlier version. New features include the ability to create your own custom menu items, dialog boxes, windows, buttons, and much more. The new manual is bigger and better and includes clear and accurate examples of event trapping and a variety of other programs illustrating how to take full advantage of the unique Macintosh interface. It is an interpreted BASIC, so it is a bit slow. However, the new features and an improved user interface make this a very good choice for BASIC users or teachers. Microsoft Corporation, 10700 Northup Way, Box 97200, Bellevue, WA 98009; (206) 828-8080.

BASIC	MACUSER	Jan. 86	p. 110

Programs in BASIC:			
Microsoft Basic Tricks	NIBBLE	Nov/Dec. 85	p. 42
Autolog - TeleCom	NIBBLE	Nov/Dec. 85	p. 44
MS Basic Windows	NIBBLE	Nov/Dec. 85	p. 69
Stopwatch - Program	NIBBLE	Nov/Dec. 85	p. 74
Macbanker (checking account)	NIBBLE	Jan/Feb. 86	p. 9
MS Basic List Maker	NIBBLE	Jan/Feb. 86	p. 37
Fractal Trees	NIBBLE	Jan/Feb. 86	p. 48
A Pattern Design Program in BASIC	MACWORLD	Jan. 86	p. 156

CP/M for your Macintosh. You get two volumes of documentation from Digital Research and IQ Software with six disks of programs. These programs include CP/M; a C-language compiler, macroassembler, and terminal emulation; and a standard printer driver for setting up your own printer configurations. CP/M 68K programs will run on your Macintosh. Plus CP/M 2.2 (8080) will run on your Macintosh 512K. Write for a Macintosh CP/M Software Catalog. IQ Software, 2229 E. Loop 820 N., Ft. Worth, TX 76118; (817) 589-2000.

BASIC Compilers. Pterodactyl Software is designing a PC BASIC compiler that will compile your programs on the Lisa (Macintosh XL) so they can run on the Macintosh. It is not only compatible with the IBM PC BASIC compiler, but numerous extensions are added (mouse and QuickDraw routines). The Lisa version of PC BASIC runs under the Lisa Workshop. It is ready now. The Macintosh cross-compiler requires a Lisa with Workshop and Software

Supplement. Current prices: Lisa to Macintosh Cross-Compiler —$1,000 (with runtime license); Lisa Compiler—$250 (without runtime license). Vendor: Pterodactyl Software, 200 Bolinas Road #27, Fairfax, CA 94930; (415) 485-0714.

Neon is an object-oriented programming language. It uses an environment like SmallTalk to allow access to the Macintosh toolbox. Programmers can then use the objects in the toolbox to create programs. Using this language results in very compact and executable code. Portions of any written program can be done in assembly language to improve speed. Included in the language are easy access to QuickDraw routines and a mouse-driven editor. Price: $150. Vendor: Kyria Systems, Inc., 505 N. Lake Shore Drive #5510, Chicago, IL 60611; (312) 822-0624.

Neon	**A+ MAGAZINE**	**Mar. 86**	**p. 128**

MacNosy is called by some "the disassembler for the rest of us." It is an interactive disassembler that enables Macintosh developers and Macintosh hackers to recover the source code of any Macintosh application file, ROM, or code-type resources in the System file. It runs on the Macintosh 512K and one-megabyte Lisa systems. With it, the developer can do the following: subdivide a program into procedures using a treework and flow analysis, selectively view procedures, produce a reference map for procedure names or trap names, and much more. Use of this product requires knowledge of programming and assembly language. Price: $50. MacNosy is available directly from Jasik Designs, 343 Trenton Way, Menlo Park, CA 94025.

MacTraps is a collection of Macintosh PROCEDURE and FUNCTION calls. With this valuable programmer's resource, you can access the format of many of the codes referenced in *Inside Macintosh*. There are three different types of objects in MacTraps: (1) "Names" describes either the name of the chapter or the name of the section(s), (2) "Nodes" refers to the icons representing the names, (3) "Links" indicates the lines that let you select what chapter you wish by clicking on the line and then linking to the file of interest. Vendor: Network Nexus, 3 Twin Dolphin Dr., Suite 220, Redwood City, CA 94065; (415) 591-2101.

Macintosh Pascal is an interpreted Pascal. The main difference between it and UCSD Pascal is the screen environment within which you work. Running, stepping, filing, editing, and printing operations can all be performed within windows on the Macintosh screen. Available from Apple Computer.

Pascal	**MACUSER**	**Jan. 86**	**p. 114**

Manx Software Systems has **Aztec C68K C** for the Macintosh ($499). Also, **Aztec C68K-P** ($199), **Aztec C68K TOOLS** ($249). (800) 221-0440, or in New Jersey call (201) 780-4004.

C	**MACUSER**	**Jan. 86**	**p. 112**
C Programming	**MACUSER**	**Mar. 86**	**p. 104**

ExperLisp is the first complete implementation of LISP on a microcomputer. Developed on a Symbolics 3600, the compiler generates code optimized for the MC68000 microprocessor. The resultant speed combines with the "LISP machine-like" features of the Macintosh to create a LISP environment that is very effective on a microcomputer. This is a great language for developing artificial intelligence and expert-systems applications. Contact ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108; (805) 969-7874.

ExperLogo is a compiled Logo for the Macintosh. There are enhanced graphics and list-processing features. Applications can be run interpreted or compiled.

Expert Systems Building Tool. The well-established expert-systems building tool, OPS5, is now available on a personal computer. ExperOPS5 combines the processing power of the Macintosh with the rich LISP features of ExperLisp to create an environment for expert-systems development that rivals those previously found only on expensive LISP machines.

ExperOPS5 is testimony to the power and versatility of ExperLisp. Science Applications International Corporation of La Jolla, California, successfully converted more than 5,000 lines of OPS5 LISP source code into ExperLisp. The resulting implementation of ExperOPS5 retains the function and speed of its Xerox 1108 counterpart while running on the much cheaper Macintosh.

ExperOPS5 features a forward-chaining inference engine coupled with a powerful pattern-matching algorithm. A special added feature is an interface that provides users with complete access to ExperLisp.

ExperOPS5 requires ExperLisp, a Macintosh 512K and an add-on floppy- or hard-disk drive. It is available through selected computer retail outlets, as well as direct from ExperTelligence. Dick Messier, ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108; (805) 969-7874.

MACKIT (Expert System). MacKit Level 1 is the first of a series of products from Knowledge System Environments, Inc. designed to bring AI technologies to knowledge workers. You are the expert: If you analyze symptoms, deduce probable causes, and recommend actions (for example, if your field is medical diagnosis, financial consulting, automotive troubleshooting, failure mode analysis, information system trouble-desk, equipment troubleshooter, decision support, or strategic planning) then your knowledge can be represented in production rules, and MacKit can provide a productivity tool to model and distribute your problem-solving expertise. Knowledge System Environments, 201 South Road, Dillsburg, PA 17019; (717) 766-4496.

Expert-Systems Builder/ Inference Engine for the Macintosh. An expert-systems language, ExperFacts (developed by Mc-Systems) can be used to create working expert systems for most applications. ExperFacts provides all the features needed for flexible knowledge-based programming including backward/forward chaining and Metalevel rules. ExperFact's versatile internal pattern-matching routines allow users to implement powerful concepts such as recursive code and "Frame" representation of the knowledge base.
Additional features include *Caching*, a speed-optimization function that automatically stores inferred data for future use; *Justification,* storing of processing data to allow verifications of solutions; *Knowledge Partitioning,* which allows users to group their knowledge base in smaller, more convenient and easily managed partitions; and *Software Hooks*, which provide a facility to access LISP routines or conventional language during processing. ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108; (805) 969-7874.

Miscellaneous Articles on Computer Languages

Forth	MACUSER	Mar. 86	p. 115
The Macintosh Lisp Machine	MACWORLD	Mar. 86	p. 99

Database

Microsoft File is a sophisticated data-base product that is well integrated with the Microsoft series of programs (Multiplan, Word, Chart). Microsoft Corporation, 10700 Northup Way, Box 97200, Bellevue, WA 98009; (206) 828-8080.

Filevision is a data base that allows the user to create a picture and then attach records and fields of information to various parts. Consider, for example, designing an on-screen picture of the seating plan in a theater. You could ask questions such as: "Where are the empty seats in the theatre?" or "who's sitting in Row 5, Seat 56?" This package is limited only by the creativity of the user. Price: $195. Telos Software Products, 3420 Ocean Park Blvd., Santa Monica, CA 90405; (213) 450-2424.

Business Filevision integrates a powerful filing and drawing system with a versatile report generator. Telos Software Products, 3420 Ocean Park Blvd., Santa Monica, CA 90405; (213) 450-2424.

Business Filevision	MACAZINE	Vol.3 No.2	p. 83
Business Filevision	MACUSER	Feb. 86	p. 46
Business Filevision	A+ MAGAZINE	Feb. 86	p. 135
Filevision gets down to business	MACWORLD	Mar. 86	p. 94

FactFinder is made by Macware and is an electronic "desk drawer" that facilitates manipulation of data within the data base. (800) MACWARE.

Main Street Filer is a data-base management system that can handle 36 fields per record, 65,000 records per file. Can be used for customer/prospect lists, direct mail and renewal lists, appointments, inventory control, accounts payable and receivable reminder files, sales activity and follow-ups. This product has been out for a while so there should be a good deal of feedback available about it. Vendor: Main Street Software, One Harbor Drive, Sausalito, CA 94965; (415) 332-1274, or (800) 824-8757.

1STBASE is a relational data-base system from DeskTop Software Corporation, 228 Alexander Street, CN5287, Princeton, NJ 08540; (609) 924-7111.

PFS: File and **Report** make up a simple-to-use data-base management package. Those who are experienced with the PFS: series on the Apple II will recognize the way in which this application is implemented. The basic idea is to prepare a data-input form that facilitates the creation of new records of information. Simple menus then allow for a variety of searching and reporting criteria. Software Publishing Corporation, 1901 Landings Drive, Mountain View, CA 94043; (415) 962-0191.

OverVUE is an information manager for the Macintosh developed by ProVUE Development Corporation. (714) 969-2431 (Calif.).

Odesta Helix is an interactive information system made by Odesta. (800) 323-5423, or in Illinois, (312) 498-5615.

Helix 2.0	MACUSER	Mar. 86	p. 48

Omnis 3 is a data-base program that will calculate, arrange, store, sort, and retrieve data. Data-base layout may have up to 9,600 characters and up to 120 fields. Includes a report generator (compatible with MacWrite). Organizational Software Corporation; (415) 571-0222 (Calif.).

Omnis 3	MACUSER	Mar. 86	p. 42

Brock Keystroke Data Base by Brock Software Products, Inc., is an electronic file cabinet that enables you to store, find, update, or print information. Has its own report generator. (815) 459-4210 (Illinois).

MegaFiler is a data-base program that handles mailing lists, multiple-file access, and integration with other Megahaus products, as well as the standard data-base functions. (619) 450-1230 (Calif.).

DB Master is a very popular data-base that was first implemented on the Apple II series of computers. Available from Stoneware, Inc., 50 Belvedere St., San Rafael, CA 94901; (415) 457-1656.

MacLion is a relational data-base manager and applications development system for the Macintosh. It is produced by Computer Software Design, Inc., 1904 Wright Circle, Anaheim, CA 92806; (714) 634-9012. One of the unusual features of this data-base is that it has a programming language built in.

Education

Speed Reader II is a Macintosh program that has already proven successful on IBMs, Commodores, and Apple IIs. Regular use of the program has been shown to double or triple the reading speed (as well as improve comprehension). The program takes advantage of all of the Macintosh features (pull-down menus, mouse use, icons, and on-line help). This program is well orchestrated and, with proper commitment from the user, can really improve the user's reading speed. This application should be quite popular in the college and university environment. For more information, contact Dr. Jan Davidson, Davidson & Associates, Inc., 6069 Groveoak Place #12, Rancho Palos Verdes, CA 90274; (213) 373-0971.

STELLA is like a conceptual Lego set. Using STELLA's toolkit, you select, position, and connect various structural elements to piece together a set of relationships. As you do, STELLA automatically generates many of the equations necessary to simulate the behavior of the system that you are creating. Additional equations are easy to include, either by sketching in curves with the mouse, or by clicking-in special functions included in STELLA's "built-ins" list. Once a structural diagram is complete, you can view the system's output as an animation of the diagram, or as plots or printed numerical values. (Barry Richmond, Professor, Dartmouth College, President, High Performance Systems, Inc.)

More Information: More information about STELLA is available from High Performance Systems, 13 Dartmouth College Highway, Lyme, NH 03768; (603) 795-4122. Academic price: $102.50 (add $10 for international orders). Volume discounts available.

Fonts

Fluent Fonts provides dozens of fonts for use in your word-processing applications. Two-disk set is $49.95 from Casady Company, P.O. Box 223779, Carmel, CA 93922; (408) 646-4660.

Fluent Fonts	A+ MAGAZINE	Jan. 86	p. 147

Soft Palette Font (Volume 1) contains a collection of 18 decorator fonts. There are borders and interior design symbols. Price $35. Vendor: Decision Science Software, Inc., P.O. Box 7876, Austin, TX 78713; (512) 926-4527.

Professional Type Fonts comes with two disks. One disk contains fonts for text and the other contains fonts for headlines. These are modeled after the famous Mergenthaler and ITC typefaces (Times, Helvetica, Roman, and Optima). Sixteen fonts are provided in sizes from 12 point to 24 point (the headline fonts are larger). You need a Macintosh 512K. Prices: Text Fonts-$49.95; Headline Fonts-$69.95. Vendor: Kensington Microware Ltd., 251 Park Ave. S., New York, NY 10010; (212) 475-5200.

Dayton Math Fonts contains four math fonts (over 700 characters) that are suitable for use in preparing technical manuscripts. Included are all of the standard mathematical symbols, fractions, Greek and Roman alphabets (with tildes, bars, and carets), special integrals, summations, and much more. Price: $29.95. Vendor: Plugh, Inc., 595 Royal Springs, Springboro, OH 45066; (513) 748-2423.

UltraFonts is a disk with some new fonts for the Macintosh. There are two new packages: Technical and Business Fonts features a variety of fonts for engineers, scientists, doctors, and lawyers that include more than 100 symbols (two Greek language fonts, math symbols, correspondence quality text), UltraFonts Edition Two features 21 fonts in sizes ranging from 6 points to 36 points. There is a borders font, symbols font, international symbols, Macintosh icon font, and more. Price: $29.95 each, or both for $49.95. Vendor: 21st Century Software, Malon Products, Inc., 2306 Cotner Ave., Los Angeles, CA 90064; (213) 829-4436.

UltraFonts Edition 2	A+ MAGAZINE	1/86	p. 149

FONTastic	MACUSER	Dec. 85	p. 38
FONTastic	MACWORLD	Feb. 86	p. 126

ClickArt Letters	A+ MAGAZINE	Jan. 86	p. 146
Decowriter	A+ MAGAZINE	Jan. 86	p. 146
Font Agenix	A+ MAGAZINE	Jan. 86	p. 147
Headline Graphics	A+ MAGAZINE	Jan. 86	p. 147
Kensington Professional Fonts	A+ MAGAZINE	Jan. 86	p. 148
Mac The Knife: World Class Fonts	A+ MAGAZINE	Jan. 86	p. 148
Superfonts	A+ MAGAZINE	Jan. 86	p. 148
SuperFrench, German Spanish	A+ MAGAZINE	Jan. 86	p. 148
Tech: Math Science Fonts	A+ MAGAZINE	Jan. 86	p. 149

Games

Airborne is a very exciting arcade-type game that continually challenges your skills. It is a little bit like the game Sabotage (which is familiar to many game players). This game lets you control an anti-aircraft gun and a mortar. You are being attacked by helicopters, infantry, tanks, paratroopers, missiles, jet planes, and cargo planes, just to name a few. Great graphics, excellent, realistic digitized sound. Everyone who plays seems to enjoy it. Available from Silicon Beach Software, 11212 Dalby Place, Suite 201, San Diego, CA 92126; (619) 695-6956.

Sargon III is a great way to play chess. It is, however, not easy to beat Sargon (turning off its opening-move library and selecting easy play gives you a fighting chance). The special features of this implementation (windows that track moves, instant replay, move retraction, libraries of openings and closings, piece movement using the mouse rather than notation, and much more) make this the best chess game around. Great for learners or experts. Hayden Software Company, Inc., 650 Suffolk St., Lowell, MA 01854 (617) 937-0200

Sargon III vs. Psion	MACUSER	Mar. 86	p. 81

Trivia asks a lot of difficult questions and lets you know how you are doing along the way. The program is really a master of ceremonies. You don't enter the answer, you say it aloud and then ask Trivia to display the correct answer. Players in the game decide if your answer is close enough. There is a General Knowledge disk with 5,000 questions. You can be timed, prevent certain categories from being continually selected, and play at various skill levels. The five categories are entertainment, sports, geography, history, and literature. You can make up your own questions and answers if you wish (lots of potential with this). Price: $49.95. Vendor: Mirage Concepts, 4055 W. Shaw #108, Fresno, CA 93711; (209) 227-8369.

Through the Looking Glass used to be the game called ALICE. It is a program that was developed at Apple Computer during the early stages of the Macintosh project. You may have an early version of the game. The latest (and legitimate release) of the program is much better than the original. The basic idea is that you select a chess piece that you (in the role of Alice) then become. A game of real chess is played with no delay between moves. It's just you against the other player (the Macintosh). This is a fast game. The new release has several versions, including mutations, erosion, Mirror-Mouse, and Upside Down. In addition, you can create your own pieces so that the game becomes more "personalized." Lots of fun with this one. Price: $39.95. Vendor: Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014; (800) 538-9696 or (800) 662-6238.

Through the Looking Glass	MACUSER	Jan. 86	p. 33

DejaVu is an exciting new adventure game that makes excellent use of the Macintosh user interface. It's a great mystery with lots of humor. Once you start playing this one, it is very difficult to stop—certainly a fine addition to one's entertainment library. Mindscape Inc., 3444 Dundee Road, Northbrook, IL 60062; (800) 221-9884, (or in Illinois (800) 942-7315).

Deja Vu	MACUSER	Jan. 86	p. 89
Deja Vu	MACAZINE	Vol.3 No.2	p. 38

MacPoly is a game consisting of a hundred jigsaw puzzles that range from easy to downright impossible. The jigsaw puzzles are polyominoes, shapes made of squares, which you drag, spin, and flip into place.

MacPoly is the largest collection of these puzzles ever published in any form. Some puzzles are by the old masters, but most are new. Solutions provided for all but the impossible ones. The manual explains how to play, and why some puzzles are impossible, and contains a bibliography. The program runs on a Macintosh 128K or 512K. Sabaki Corporation, Dept. 3000, P.O. Box 8217, Rego Park, NY 11374; (718) 897-9638.

Articles on Miscellaneous Games

Amazon	MACUSER	Feb. 86	p. 36
Championship Boxing	MACUSER	Mar. 86	p. 87
Championship Star League Baseball	MACWORLD	Mar. 86	p. 140
Deadline	MACUSER	Dec. 85	p. 98
Fokker Triplane	MACUSER	Feb. 86	p. 93
Felony	MACUSER	Dec. 85	p. 98
Grid Wars	MACAZINE	Vol.2 No.12	p. 35
Harrier Strike Mission	MACUSER	Feb. 86	p. 93
Harrier Strike Mission	MACUSER	Jan. 86	p. 34
Infidel	MACUSER	Feb. 86	p. 32
MacChallenger	MACUSER	Feb. 86	p. 93
Mind Over Mac	MACUSER	Feb. 86	p. 32
Murder By the Dozen	MACUSER	Dec. 85	p. 98
Pinball Construction Set	MACUSER	Jan. 86	p. 36
Rogue	MACUSER	Feb. 86	p. 86
Strategic Conquest	MACUSER	Dec. 85	p. 34
Suspect	MACUSER	12/85	p. 98
Tycoon	NIBBLE	Jan/Feb. 86	p. 46
Ultima III	MACAZINE	Vol.2 No.12	p. 92
The Witness	MACUSER	Dec. 85	p. 98
Zork	MACUSER	Dec. 85	p. 97

Graphics/Design

Microsoft Chart is a business graphics package from Microsoft. It integrates well with Multiplan, Word, and File (other Microsoft products). This is an excellent package for creating and drawing graphs either by directly entering the raw data or by transferring it from a spreadsheet. The user can choose from bar charts, column charts, area charts, line graphs, pie diagrams, scatter diagrams, and combinations. Various statistical functions can be performed on the data (and created as a separate series). It is possible to plot a linear regression line of the data as well as an exponential growth curve. The final chart can be extensively enhanced with legends, titles, shadings, text, scaling, and a wide variety of other techniques. This is easy to learn and quick to use. Should be part of your library. Microsoft Corporation, 10700 Northup Way, Bellevue, WA 98004; (800) 426-9400.

Slide Show Magician takes your MacPaint documents and arranges them into a slide show presentation. Anything you can put on a Macintosh screen can be used in the slide show. You can control how long each frame stays on the screen, or even let the show run continuously. There are 16 movie-type special effects. These include wipes, curtains, fades, and much more. This is a very easy package to use and really does allow you to create "magical" slide shows. You can place "buttons" on your slide, add text, animate text, use the mouse to point and click, and even let your "shows" be sent to someone else for running on their computer (even if they do not have Slide Show Magician). Many vendors use this product to display their products' features to potential customers. It may be a good addition to your software library. Price: $59.95. Vendor: Magnum Software, 21115 Devonshire St., Suite 337, Chatsworth, CA 91311; (818) 700-0510.

Slide Show Magician	A+ MAGAZINE	Jan. 86	p. 94

ClickArt is a collection of picture disks. At present, there are three disks: (1) Personal Graphics (people, cartoons, arrows, and miscellaneous), (2) Publications (three-column layout guides, borders, maps, letterhead, and more), and (3) Letters (24 large alphabets). Vendor: T/Maker Graphics, 2115 Landings Drive, Mountain View, CA 94043.

Special Effects was developed by T/Maker Graphics (above) as a supplement to MacPaint. When installed on your MacPaint disk (easily done), you have four additional tools available for your use: (1) 360-degree rotation of text (a great addition by itself), (2) a distortion effect, (3) an ability to slant text and images, and (4) a tool to add perspective to a drawing. Well worth it for heavy MacPaint users.

Buildings. Hayden Software Company has several Macintosh picture disks available for doing some very thorough designing. These are not merely "clip art" but rather "structural pieces" that can be assembled into buildings, landscapes, and so on. Currently available are daVinci: Buildings, Building Blocks, Commercial Interiors, Interiors, and Landscapes. Vendor: Hayden Software Company, 600 Suffolk Street, Lowell, MA 01853; (617) 937-0200.

VideoWorks is a package designed to help you animate the images on your Macintosh screen. It is a comprehensive package that includes a Master disk, a "movies disk" (with sample animations), and a disk with a lot of artwork on it in the form of MacPaint drawings. Pictures are brought into VideoWorks with a desk accessory called ArtGrabber (a very nice tool all by itself). You can also draw directly in VideoWorks. The documentation is excellent and guides you through the development of animation. We will be looking at this package more closely in the next issue. It is an excellent example of a program that takes full advantage of the capabilities of the Macintosh. Vendor: Hayden Software, 600 Suffolk Street, Lowell, MA 01854; (617) 937-0200.

Other Items of Interest on Graphics

MacDraft	MACUSER	Feb. 86	p. 81
MacDraft	MACUSER	Dec. 85	p. 36
MacDraft	MACAZINE	Vol.3 No.1	p. 76
MacDraft	MACWORLD	Jan. 86	p. 92
MacIntizer	MACUSER	Jan. 86	p. 86
Macromind Utilities	MACUSER	Feb. 86	p. 36
MacTablet	MACUSER	Jan. 86	p. 84
Magic Slate	MACUSER	Feb. 86	p. 32
4 Paint	MACAZINE	Vol.3 No.1	p. 43

Hardware

ThunderScan is a hardware attachment that can make any printed image into a detailed, high-resolution Macintosh graphic—turning the ImageWriter into an "image reader." The device replaces the ImageWriter ribbon cartridge that will scan any image you can roll into the printer and send it to the Macintosh. You can enlarge an image up to 400 percent or shrink it to 25 percent. The device is easy to set up, focus, and use. The software is well-written, MacPaintlike in its design, and even incorporates a new auto-scrolling feature when viewing a large picture. When the scanning is done, the gray scales are retained. You can then adjust the brightness and/or contrast to your liking. Works well for transferring images from magazines, pictures, photographs or what have you. Price: $229. (415) 254-6581 (Calif.).

MouseAround is a drawing tool you insert the mouse into to give you greater control, as well as a guide to facilitate drawing or tracing. It is a 12 inch by 12 inch plastic drawing-surface board with a built-in mechanism for holding the mouse. Vendor: FrontRunner Computer Industries, 316 California Ave., Suite 712, Reno, Nevada 89509; (702) 786-4600.

MacTablet is a graphics tablet that connects to the Macintosh that allows for very detailed drawing or tracing. It works with MacPaint, MacDraw, and a variety of other software. Utilizes a pen complete with buttons. It seems to perform as well as the mouse in normal situations and much better in detail drawing. Available from Summagraphics Corp., 777 State St. Extension, Fairfield, Conn. 06430; (203) 384-1344.

Mac•Turbo•Touch by Assimilation Process is a track-ball input device for the Macintosh. It can be used instead of the mouse or right along with it (the mouse plugs into the back of the Turbo Touch). The Turbo Touch features two buttons and a track ball that give surprisingly good control over cursor movement. It's not great for fine drawing, but certainly provides a faster way to move the cursor around the screen. Try one out at your dealer. Price: $129. (800) MAC-5464, or in California (800) 421-0243, or in Canada (404) 446-0797.

MacStation by MicroRain is a stand with storage space for the Macintosh, ImageWriter, and external disk drive. (800) 547-4000, Dept. 410, or in Oregon or outside the U.S., (503) 684-3000, Dept. 410.

MacDrive by Tecmar, Inc., can be a 10-megabyte fixed hard disk or a 5-megabyte removable hard disk (with an option of adding five more megabytes). Phone: (216) 349-0600 (Ohio).

OmniDrive, a network-ready hard disk, by Corvus Systems, Inc. Price: $1,795 for the 5.5-megabyte model. (408) 559-7000 (Calif.).

HyperDrive is a hard disk that is built into your Macintosh. It stores 10 megabytes of data, and is extraordinarily fast. It transfers data at a 5-Mbit-per-second rate—up to seven times faster than external drives. Files can be divided up into 32 drawers of any size you wish. Resizing takes place automatically. Works quite well with the Macintosh Finder. General Computer Company, 215 First Street, Cambridge, MA 02142; (800) 422-0101. Consortium pricing available.

HD20 and the HyperDrive 20	A+ MAGAZINE	Feb. 86	p. 125
HyperDrive	MACUSER	Feb. 86	p. 63

The Keeper is a hard-disk system made for the Macintosh by Micro-Design of Austin, Texas. Built-in printer buffer; runs four to six times faster than floppy disks. Adds up to 33 megabytes of storage. (800) 531-5002, or in Texas, (512) 441-7890.

The Bernoulli Box is a cartridge disk system made by IOMEGA Corporation of Utah (1821 West 4000 South, Roy, Uah 84067). Has 5-megabyte removable cartridges. (800) 556-1234, X215, or in California, (800) 441-2345, X215. The Bernoulli Box uses highly reliable, easily transportable, 5-megabyte cartridges. This allows users who share Macintoshes or peripherals to "take their data files along with them." IOMEGA has some very attractive pricing arrangements for colleges and universities.

The Bernoulli Box Network Server is a high-performance, mass-storage subsystem using two 10-megabyte removable cartridge drives developed by IOMEGA. It has been designed to interface with the AppleTalk network. The server has been carefully designed to provide the benefits of mass storage to multiple users. This is accomplished by partitioning the disk cartridges into 1-megabyte multiples that a user may select from. These partitions can be password protected. This server allows any user to have multiple partitions on the Macintosh at one time but no partition may be used by more than one user at the same time. To back up 10 megabytes requires only about 4 1/2 minutes.

Other Hard Disks

Mac 10 (hard disk)	MACAZINE	Vol.3 No.1	p. 65
Hard Disk 20	MACWORLD	Jan. 86	p. 77
MacBottom	MACAZINE	Vol.3 No.1	p. 24

Composite Video Adapter from Mentauris connects the Macintosh to a wide range of commercial video monitor and projection equipment. (512) 396-1565 (Texas).

MACQUISITION is a set of tools for collecting and logging data from laboratory instruments and industrial sensors. The user can define an application using a simple spreadsheet (right now, Multiplan) template. Data is then automatically collected, analyzed, charted, and reported. Macquisition uses the Taurus One/05 data-acquisition and control peripheral. This unit interfaces with a wide variety of signals, including analog input, digital input/output, analog output, and counters. (There are 16 analog input channels and 16 digital input/output channels.) The unit offers 12-bit resolution on analog inputs and outputs with analog input gains from 1 to 1,000. Systems begin at $2,595 without a Macintosh and can be configured with a variety of options. Contact the vendor directly for information about pricing, discounts, multiuser systems, and the like. Small Business Computers of New England, 4 Limbo Lane, P.O. Box 397, Amherst, NH 03031; (603) 673-0228.

MouseHouse is, quite simply, a holder for the Macintosh mouse. It is used when the machine is not in use. It attaches to either side of the Macintosh with removable Velcro strips. The MouseHouse matches the color and contours of the mouse and looks like an integral part of the machine's exterior. Suggested retail price is $5.95. Contact FrontRunner Computer Industries, 316 California Ave., Suite 712, Reno, NV 89509; (702) 786-4600.

Print 'n' Switch allows you to use both an ImageWriter and a letter-quality printer with your Macintosh. It plugs into the printer port on the rear of the machine (leaving the modem port free to be used by other peripherals). The ImageWriter and letter-quality printer plug directly into a small Print 'n Switch box. At the press of a button, either printer is activated. Works with most letter-quality printers. Price: $119.95. FrontRunner Computer Industries, 316 California Ave., Suite 712, Reno, NV 89509; (702) 786-4600.

MacEnhancer lets Macintosh users connect additional peripherals. It adds one IBM-type connector for parallel printers, and two IBM-type connectors for serial printers, modems, and host connections. The package includes printer-driver and terminal-emulation software. Supports almost all dot-matrix printers, but only the Epson LQ1500 and Toshiba P1351 letter-quality printers at present. Price: $249. Microsoft Corporation, 10700 Northup Way, Box 97200, Bellevue, WA 98009.

MacCharlie provides a coprocessor that enables Macintosh to run IBM PC software. It takes only five minutes to install, and makes switching between IBM and Macintosh applications as quick as a mouse. Dayna Communications, 50 South Main Street, Suite 530, Salt Lake City, UT; (800) 531-0600.

MacCharlie (file transfer)	MACWORLD	Feb. 86	p. 120
MacCharlie	MACUSER	Dec. 85	p. 61
MacCharlie	MACWORLD	Feb. 86	p. 120
MacCharlie (file transfer)	A+ MAGAZINE	Jan. 86	p. 129

MacADIOS is a powerful tool to be used by scientists, engineers, teachers, and production facilities. It turns the Macintosh into a powerful laboratory workstation that can control and monitor scientific experiments and processes. In seconds, laborious data-taking tasks can now produce attractive graphs of a quality unmatched by computers in this price range. GW Instruments, 3 Ames Street, Cambridge, MA 02139; (617) 577-1524.

Miscellaneous Hardware

Abaton (file transfer)	A+ MAGAZINE	Jan. 86	p. 129
Granny Smith Connection	MACAZINE	Vol.2 No.12	p. 80
ImageWriter II	MACWORLD	Jan. 86	p. 86
Macintosh Plus	MACWORLD	Feb. 86	p. 57
Macintosh Plus	A+ MAGAZINE	Mar. 86	p. 22
Macintosh Plus	MACUSER	Mar. 86	p. 39
5 Memory Upgrades	MACWORLD	Feb. 86	p. 115

Miscellaneous

Mail Center is a program that allows Macintosh users connected via the AppleTalk Personal Network to communicate by means of computerized mail. Letters, memos, charts, graphs, spreadsheets, and programs created on a Macintosh may be sent to any other Macintosh. The information may be sent without interrupting the person receiving the mail. Mailbox icons identify where mail can be sent and a "mail receiver" desk accessory actually receives any mail that is sent to that user. A receive log keeps a list of all mail received by a given mailbox. Videx, Inc., Corvallis, OR 97330; (503) 758-0521.

The DNA Inspector is a set of Macintosh programs used for analyzing DNA sequences. In effect, the programs, written in Microsoft BASIC, allow recombinant DNA experiments to be designed with the computer before they are attempted in the lab. Besides being of value to the scientist as a tool, the programs can be used by the nonscientist to learn about the techniques of modern molecular biology, or as a teaching tool by educators. The programs are available for $109 from

TEXTCO. The package includes the DNA Inspector Programs, the DNA sequence of several recombinant DNA vectors (pBR322, M13 phage, and SV40), and instructions. User must supply Microsoft BASIC. (A Version 2 offering many new features is under development and should be available in the summer.) Add $5 for overseas shipment. Textco, 27 Glison Rd., W. Lebanon, NH 03784.

Scientific Analysis Program is used to solve both numerical and statistical problems. It requires Microsoft BASIC. With the two disks provided, the user can solve linear, nonlinear, complex, and sets of simultaneous differential equations. In addition, the program does linear regression and curve fitting, calculates definite integrals, and solves matrix equations. Price: $35. Vendor: PCA Software, P.O. Box 1231, Arlington, TX 76010; (817) 860-5498.

MAC•MEMORY•DISK by Assimilation Process lets you allocate a portion of the RAM resident in your Macintosh 512K and treat it like a disk. Significantly increases the speed of many applications. Price: $29. (800)MAC-5464 or in California, (800) 421-0243 or in Canada, (404) 446-0797.

MacLabeler helps you keep track of what's on your disks. This application creates labels that will automatically list up to 20 file names. You can choose whether a file is included on the list or not. A helpful utility. Price: $49.95. Vendor: Ideaform Inc., P.O. Box 1540, Fairfield, IA 52556; (515) 472-7256.

MacCalendar by Videx, Inc. is a time management tool. It combines the alarm clock with a calendar and a notepad. It can be installed as a desk accessory to be available whenever you need it. Attractive and easy to use, this one is only useful if you are disciplined enough to keep entering your appointments and regularly check on their status. Price: $89. (503) 758-0521.

P/C Privacy is a data encryption system that protects your text or graphics files from being viewed by others. The user "decodes" an encrypted file by entering a key word, which can be changed. Price: $140. Vendor: MCTel, Inc., 3 Bala Plaza E #505, Bala Cynwyd, PA 19004; (800) 628-3584, or in Pennsylvania, (215) 668-0983.

SmoothTalker is an exciting product that converts plain English text, from either the keyboard or a MacWrite text document, into high-quality and natural-sounding speech. Mouse-driven commands allow you to specify the speed, pitch, tone, and volume to produce both male and famale voices. A dictionary can be created with words that SmoothTalker doesn't speak particularly well. Several software developers are incorporating this product into applications that will soon reach the market. The technology can be obtained in two ways: as a stand-alone retail product, and as licensable software modules for the developers and universities that can be embedded within the author's own programs. Some changes currently under way include enhanced phonetic capability, faster conversion, and use as a "driver" from other language programs. First Byte, 2845 Temple Avenue, Long Beach, CA 90806; (213) 595-7006, (800) 523-8070, or in California; (800) 624-2692.

SmoothTalker update. Enhancements include two voices, male and female; ability to call SmoothTalker from your own programs; faster text-to-speech conversion on Macintosh 512K; ability to insert timed delays anywhere in a document being spoken; ability to automatically repeat passages; ability to show phonetic equivalents; and a new on-line user's guide.

FlashFinder is a program that allows users to replace Apple's icon-oriented Finder with one that saves disk space, as well as speeding up application load time. When a disk that has *FlashFinder* on it is booted, the Application Launcher Dialog Box will appear, listing all the applications available on the disk. You can open an application, use the desk accessories, go to the File Manager, or go to the standard Macintosh desktop environment.

The File Manager lists all the files on a disk. However, if you highlight an application in the Application Launcher and then go to the File Manager, only the files associated with that application will be listed. You can choose the List All option to see the remaining files. From the File Manager, you can quickly open, rename, or delete a file.

FlashFinder also allows you to eject disks and switch disk drives. UNICOM, Software Development Group, 297 Elmwood Ave, Providence, RI 02907; (401) 467-5600.

Comet Halley	MACUSER	Jan. 86	p. 32
Dinner At Eight	MACUSER	Jan. 86	p. 32
Entrepreneur	MACAZINE	Vol.2 No.12	p. 80
Front Desk	MACUSER	Dec. 85	p. 36
Hippo Almanac	MACUSER	Jan. 86	p. 33
LogiMac (digital logic design)	MACAZINE	Vol.3 No.1	p. 96
SCSI Macport	A+ MAGAZINE	Feb. 86	p. 157
Starting a New Business	MACUSER	Dec. 85	p. 36
Statview	MACUSER	Dec. 85	p. 38
Tellstar	MACAZINE	Vol.3 No.1	p. 62

Music

MusicWorks is great fun—especially for those skilled in music. However, anyone can learn to use this program and have a good time. You can edit, compose, and then play your music. This can be done in MacPaintlike fashion on a predesigned staff, or you can use a facsimile of a piano. There are four voices available, 10 instruments, and a variety of playing styles. Lots of "data disks" of music are appearing at user group meetings and as freeware. When your Macintosh is connected to an external speaker (via the built-in audio jack), it really sounds great. Price: $79.95. Vendor: Hayden Software, 600 Suffolk St., Lowell, MA 01854; (800) 343-1218.

SongPainter is a music program that comes with built-in chords, scales, and an orchestra of instruments. The user can combine instruments, pitch, rhythms, and chords using a unique picture-painting scheme. There are some special effects, as well as accents for rhythm, adjustable tempo and volume, and a Help screen (when needed). Vendor: Rubicon Publishing, 6300 La Calma Dr., Suite 100, Austin, TX 78752; (512) 454-5004.

A Review of Music Software	MACWORLD	Feb. 86	p. 93
Deluxe Music Construction Set	MACWORLD	Feb. 86	p. 109
Deluxe Music Construction Set	MACUSER	Mar. 86	p. 75
Deluxe Music Construction Set	MACUSER	Feb. 86	p. 34
Deluxe Music Construction Set	MACAZINE	Vol.2 No.12	p. 84
MIDI for the Macintosh	A+ MAGAZINE	Feb. 86	p. 117
Music Software	MACWORLD	Feb. 86	p. 92
Professional Composer V2	MACWORLD	Feb. 86	p. 109
Professional Composer V2	MACAZINE	Vol.2 No.12	p. 85
Total Music	MACUSER	Jan. 86	p. 34

Spreadsheets

Multiplan by Microsoft is a spreadsheet that is unusually easy to use. This application takes advantage of the Macintosh user interface to provide a very powerful spreadsheet with many built-in functions. Microsoft Corporation, 10700 Northup Way, Bellevue, WA 98004; (800) 426-9400.

Multiplan	MACUSER	Mar. 86	p. 61

Jazz is an integrated package that includes word processing, a data base, a spreadsheet, graphics, and communications. It features a number of powerful built-in functions. A new feature called "HotView" ties data in one application to data in any or all of the others. Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142.

JAZZ	MACWORLD	Jan. 86	p. 96

Microsoft Excel is not just a new program—it's a new standard. It offers the best of Lotus 1-2-3, and more: a spreadsheet that's big (256 columns and 16,384 rows) and incredibly fast; powerful, easy-to-use macros; the full capability of Microsoft Chart; and two-way file capability that lets your Excel files work with Multiplan, Chart, and 1-2-3 files.

- View, consolidate, and link worksheets and charts just by pointing and clicking the mouse.
- Use more than 80 built-in mathematical functions, including all financial functions, or create your own.
- Create powerful timesaving macros easily by having Excel record your actions or by programming them yourself.
- Design your worksheets to emphasize anything you want by varying fonts and font sizes or by using boldface, italics, and borders to call attention to specific cells or regions.
- Choose from a list of 19 built-in numerical formats (including currency, date, time, and percentage) or create your own custom formats.
- Build "What if?" tables and quickly solve multiple-variable formulas.
- Build presentation-quality charts instantly, because worksheets and charts are linked automatically.

Microsoft Corporation, 10700 Northrup Way, Box 97200, Bellevue, WA 98009; (206) 828-8080.

Excel	MACUSER	Dec. 85	p. 41

CRUNCH is a power spreadsheet for the Macintosh. In two of the most important measures of the spreadsheet power—size and speed—Crunch beats all other spreadsheets. The Crunch spreadsheet program stores substantially more cells than Lotus 1-2-3, and performs calculations noticeably faster.

In addition to size and speed, Crunch offers you more features than any other spreadsheet. The *right* features, ones you can really use in making faster and better decisions. These Crunch power features:

- Provide more built-in functions than other spreadsheets, and let you create your own custom functions.
- Link spreadsheets, so that you can quickly and easily share information from several spreadsheets without retyping numbers.
- Show you more of your spreadsheet all at once, because Crunch lets you display twice as many rows of figures as any other spreadsheet for the Macintosh.
- Provide special "auditing" features that let you review your spreadsheets's structure and help ensure that your decisions are based on sound data.

PALADIN Software Corporation, 2895 Zanker Road, San Jose, CA 95134.

CRUNCH	MACUSER	Jan.86	p. 61

Integrated Packages/Miscellaneous

Jazz, Excel, Crunch	NIBBLE	Nov. 85	p. 52
Excel Functions	A+ MAGAZINE	3/86	p. 141

Telecommunications

MacTerminal is a data communications program from Apple that, when used with a modem, allows the Macintosh to emulate other data terminals (IBM 3278, DEC VT100, DEC VT52, and TTY). It provides access to a variety of electronic information services, and data can be easily transferred back and forth between your microcomputer and a mainframe. Available from Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; (800) 538-9696.

MacTerminal	MACUSER	Dec. 85	p. 85

The Apple Modem is a hardware product available from Apple for use in making the telephone link between your Macintosh microcomputer and a mainframe. Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014 (800) 538-9696.

Telecommunications Related

AppleTalk	MACUSER	Mar. 86	p. 68
HabaCom	MACAZINE	Vol.2 No.12	p. 14
In Touch V2	MACAZINE	Vol.2 No.12	p. 23
MacCommunications	A+ MAGAZINE	Jan.86	p. 137
Mite V2.9	MACAZINE	Vol.2 No.12	p. 15
Pro Com-M 1.65	MACAZINE	Vol.2 No.12	p. 18
Red Ryder 6.0	MACAZINE	Vol.3 No.1	p. 91
Red Ryder 6.2c	MACAZINE	Vol.2 No.12	p. 21
SMARTCOM II	MACAZINE	Vol.2 No.12	p. 22
Telescape	MACAZINE	Vol.2 No.12	p. 20
Versa Term	MACAZINE	Vol.2 No.12	p. 26

Modems (article)	MACUSER	2/86	p. 74

Mac•Daisy Wheel•Connection by Assimilation Process can tie the Macintosh to the Apple Daisy Wheel Printer, the Brother (HR series), the C-Itoh (Starwriter), the Daisywriter, the Diablo, the NEC Spinwriter, and the Qume (Letterpro and Sprint II Series). This is a very easy program to learn and it works well. Price: $99. (800) MAC-5464, or in California, (800) 421-0243, or in Canada, (404) 446-0797.

NEC Information Systems, Inc. matches the Macintosh with a Spinwriter printer. (800) 343-4419, or in Massachusetts, call (617) 264-8635.

Utilities

The HouseKeeper	MACUSER	Dec. 85	p. 35
MacDisk Catalog	MACUSER	Dec. 85	p. 35
MacExpress	MACUSER	Feb. 86	p. 33
MacPlot	MACUSER	Dec. 85	p. 34
MacZap	MACUSER	Jan. 86	p. 32
Switcher	MACUSER	Dec. 85	p. 120
TypeNow	MACUSER	Jan. 86	p. 36

Word Processing

Mac•Spell•Right by Assimilation Process helps correct spelling and provides a thesaurus for your use. Works only with the new disk-based MacWrite. Easy to use. Price: $89. (800) MAC-5464, or in California (800) 421-0243, or in Canada, (404) 446-0797.

MacSpell+	MACWORLD	Mar. 86	p. 130

Hayden: Speller is a spelling-checker program that works with either MacWrite or Microsoft Word. It is not necessary to switch back and forth between it and your application. Its dictionary contains over 22,000 entries; you may also create dictionaries of your own. Price: $79.95. Vendor: Hayden Software, 600 Suffolk St., Lowell, MA 01854; (800) 343-1218.

Hayden Speller	MACWORLD	Jan. 86	p. 131

ThinkTank is an idea processer that provides an outline format for you to "arrange your ideas." Great for preparing outlines of research papers, reports, articles, or to-do lists. This is not a full-fledged word processor and does not (as far as we know) interface with one (such as MacWrite). Living Videotext, Inc. in Mountain View, California; (800) 556-1234, X213, or in California, (800) 441-2345, X213.

ThinkTank	MACUSER	Jan. 86	p. 52

MegaMerge works with MacWrite to provide the capability to create and merge mailing lists with documents, print mailing labels, and chain documents together so they print as one long document. Available from Megahaus. (619) 450-1230.

Microsoft WORD is a very powerful word-processing program from Microsoft Corporation. It seems to have some significant advantages over the current versions of MacWrite.

Some features in Microsoft Word and not in MacWrite:

- Footnoting capability
- Paragraph formats
- Built-in glossary
- Multiple-column formats
- List processing (mail merge)
- Multiple windows (documents) on screen
- Mouse selection shortcuts
- Built-in HELP feature

Professional Bibliographic System by Personal Bibliographic Software, Inc. is a data-base system for managing, searching, and printing bibliographic records. It can be useful to any professional who wishes to maintain an orderly library, whether it be a special department library or a personal library.

Macintosh technology has been fully utilized, with pull-down menus and print options that allow underlining, italics, or boldface type in any field desired. In addition to the default bibliographic style (the ANSI standard), APA, MLA, and Science Magazine formats are readily available. Virtually any other format can easily be generated by creating a customized punctuation file. Data entry is straightforward, with flexible screen editing and a copy-to-index capability that saves on retyping.

Biblio-Link utilities are being written that will make reformatting of downloaded citations a snap. Possible applications of the program include creating a microcomputer-based catalog for a specialized library, compiling bibliographies for inclusion in journal articles or class syllabi, or preparing publication-ready catalogs that can be illustrated using MacPaint. Personal Bibliographic Software, Inc., P.O. Box 4250, Ann Arbor, MI 48106; (313) 996-1580.

Professional Bibliographic System	MACWORLD	Jan. 86	p. 45
Professional Bibliographic System	MACUSER	Feb. 86	p. 33

Just Text	MACUSER	Dec. 85	p. 76
MacAuthor	MACAZINE	Vol.3 No.1	p. 60
PageMaker	MACWORLD	Mar. 86	p. 110

Detach here and mail.

Save 25% with this introductory offer.

☐ YES! I want to save 25% on a one-year subscription to *Wheels for the Mind*. I understand that if I sign up now, I'll receive four exciting, information-packed issues for just $12. To help us keep you abreast of current developments in your field, please complete all of the following:

Name _____

Address _____

City _____ State _____ Zip _____

Phone No.

Do you own a computer? ☐ Yes ☐ No

If so, what kind? _____

What is your major field of study? _____

Special areas of interest? _____

What sections of *"Wheels"* do you find most interesting/useful?

☐ Editorial
☐ Work in Progress
☐ Macintosh Computer Products
☐ Dialog Box
☐ Technical/Development

X _____
Signature Date

Send no money now. You will be billed later.

Detach here and mail.

Save 25% with this introductory offer.

☐ YES! I want to save 25% on a one-year subscription to *Wheels for the Mind*. I understand that if I sign up now, I'll receive four exciting, information-packed issues for just $12. To help us keep you abreast of current developments in your field, please complete all of the following:

Name _____

Address _____

City _____ State _____ Zip _____

Phone No.

Do you own a computer? ☐ Yes ☐ No

If so, what kind? _____

What is your major field of study? _____

Special areas of interest? _____

What sections of *"Wheels"* do you find most interesting/useful?

☐ Editorial
☐ Work in Progress
☐ Macintosh Computer Products
☐ Dialog Box
☐ Technical/Development

X _____
Signature Date

Send no money now. You will be billed later.

Detach here and mail.

Save 25% with this introductory offer.

☐ YES! I want to save 25% on a one-year subscription to *Wheels for the Mind*. I understand that if I sign up now, I'll receive four exciting, information-packed issues for just $12. To help us keep you abreast of current developments in your field, please complete all of the following:

Name _____

Address _____

City _____ State _____ Zip _____

Phone No.

Do you own a computer? ☐ Yes ☐ No

If so, what kind? _____

What is your major field of study? _____

Special areas of interest? _____

What sections of *"Wheels"* do you find most interesting/useful?

☐ Editorial
☐ Work in Progress
☐ Macintosh Computer Products
☐ Dialog Box
☐ Technical/Development

X _____
Signature Date

Send no money now. You will be billed later.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 453 CUPERTINO, CA

APPLE COMPUTER, INC.
WHEELS FOR THE MIND 23L
P.O. BOX 810
CUPERTINO, CA 95015

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 453 CUPERTINO, CA

APPLE COMPUTER, INC.
WHEELS FOR THE MIND 23L
P.O. BOX 810
CUPERTINO, CA 95015

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 453 CUPERTINO, CA

APPLE COMPUTER, INC.
WHEELS FOR THE MIND 23L
P.O. BOX 810
CUPERTINO, CA 95015

Apple Computer, Inc.
20525 Mariani Avenue
Cupertino, California 95014
408 996-1010
TLX 171-576

M1148

Apple Macintosh WHEELS FOR THE MIND SPRING 1986 Vol. 2 No. 2